Telephony.

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Keeping the Cable Records.

The matter of keeping track of the circuits in cable, knowing just which are in use and where the unused or spare wires terminate, is important to the large and small companies alike. Cable records are absolutely essential for the economical and efficient use of the cable. A record which is simple and accurate and yet gives all information regarding a cable circuit from the point where it leaves the exchange to the point or points where it is brought out at the pole cable terminals is invaluable to all companies which use cable. With such a record much time is saved in issuing definite instructions to the installer as to which terminals, the drop or subscriber's wires should be connected. No time is lost in unnecessary testing.

The system which is described on the other pages by Mr. Elwanger is simple and yet contains all the information that is necessary. When a telephone is to be installed, an unused circuit is readily picked out and the installer is told exactly where to connect to it. With this system, pole cable terminals may be removed from one point to another without changing the markings or designations on the cans, as they may be used in one place as well as another without confusion to the records.

High Tension Systems and Telephone Lines.

With the increasing construction of high tension power transmission lines in various parts of the country, telephone companies experience considerable trouble due to disturbances caused by these paralleling the telephone lines. These disturbances are usually caused, outside of accidental crossings, by any or all of three different influences. These influences are electric leakage conductance, electromagnetic induction and electrostatic induction. In this country the disturbance due to leakage conductance is relatively small, due to the dry climate, but in countries where the humidity is great, as in some parts of Europe, the disturbances due to this influence is so great that it is necessary to run a ground wire to the bases of all insulators on each pole. This is done in order to carry directly to ground all the current which has escaped from each insulator, from any line wire.

In regard to electromagnetic and electrostatic induction, it is not possible to eliminate them in cases of telephone lines where the ground return system is in use. Where a metallic circuit is used, the disturbances can be reduced to a satisfactory degree by transposing the wires in each pair. Theoretically the disturbances could be eliminated entirely. In many cases transposition of the telephone line is all that is necessary to cure the disturbances, especially when a balanced three phases high tension line system is symmetrically supported and the telephone metallic circuits are also symmetrically supported. In some cases, in order to secure good transmission, it has been necessary to transpose both the telephone lines and the power transmission lines. Should there be trouble on the high tension system, caused by the grounding of a wire or a broken insulator, the balance of the transposition system is broken and considerable disturbance created in the telephone circuits.

It is best to keep the telephone lines as far away from the power system as possible in order to reduce the disturbance as much as possible. The transpositions should be made carefully and care exercised in keeping the insulation of the lines in good condition.

As to Equalizing Rural Rates.

One of TELEPHONY'S subscribers has raised a question which we believe is of interest to every telephone manager who serves rural districts—that is the equalization of rural rates and the proper method which should be followed in dealing with rural subscribers generally. He says, in part:

"I know of one company which builds to each subscriber, charging the same rate to all, regardless of distance from the main lines.

I would be very glad to hear from others along this line, through TELEPHONY, as to how they handle their rural subscribers. It should not be difficult to devise a plan which will be fair to the subscribers and which will also protect the company."

TELEPHONY will be glad to receive and print suggestions bearing on this matter from those who have succeeded in working out the problem for themselves, or those who have definite ideas on how best to deal with the situation.

The Snob

By HERBERT KAUFMAN

The Snob always unmasks himself. His setting can't possibly alter his paste nature. He's an imitation. Education may cut him into the proper form and give him a false polish, but what he's made of isn't changed by the process. Real culture comes from within.

His own emphasis raises the question of his genuineness. His loudness doesn't convince. It only convicts. He doesn't set himself in a higher class—he only reminds people that he has just left a lower one.

Life is filled with elevations upon which men have been set by forces quite beyond their own control. It may be that a post of eminence permits you to look down on others—but that doesn't signify that they belong below you or that you're fit to be looked up to—perhaps it's the thing on which you stand at which folks are gazing. You may be an insignificant ornament on a pedestal far disproportionate to your size.

If you have inherited something without inheriting the qualities which produced it, you deserve no especial notice. Folks who profit by accident usually show it in their attitude toward those whom they esteem their inferiors—they make the great mistake of thinking that a big head rather than a big heart is the sign of a big man. Greatness can't lose any part of itself by simplicity—that's the stuff it's made of.

A gentleman is nothing more than a gentle man. No amount of green in your pocket can put a drop of blue in your veins—money can't make you attractive—it can merely attract people who want your money and not you. There are so many mean ways of getting rich and so many objectionable individuals are wealthy that a bank balance alone won't balance your lack of culture or refinement.

College may teach you form—contact may rub some things away—but breeding, like a complexion, is more than a surface—unless it's real, it only makes one wonder what's really beneath. When it is assumed, it's bound to wear off from time to time.

Men and women who are born to position show it by not showing it off—they aren't conscious of being different except when coarseness forces them to realize that they are of another ilk. They only know that they are above the average through contact with some one below it. They are born with their status and incomes just as they come into the world with their limbs. They no more exult over their good or lineage than you thank Providence for two arms instead of one—the sole time that you realize that you are better off than you might be is when you meet with a cripple.

Only pushers advertise their competency, and by the irony of Fate, having attained any sort of standing, they immediately lose it through a display of satisfaction which brands them as strangers in the fold.

When Lord Southcliff received word from a former valet that he had been plunged into sudden grief and millions through the death of an Australian uncle, he undertook to offer him a few words of advice:

"Do not think that you can spend your way into better circles—houses with admittance prices are not homes, but business shops. Where money is a latchkey, insincerity is always host.

"Those who do not welcome you for what you are simply tolerate you for what you have.

"Refuse any attentions which you are not privileged to return and any hospitality which you will not be permitted to reciprocate.

"Make no pretense and you will not be met with pretense.

"Exhibit the same reserve which characterized you as a good servant and the world will quickly forget that you ever were one."

Copyright by Herbert Kaufman

Galesburg, Illinois, Independent Keeps "Open House"

Exchange is Thrown Open to Subscribers for Three Days with Result that a Closer Understanding is Established Between Telephone Users and Company—Every Detail of New Exchange and Equipment Exhibited and Explained to the Many Visitors

By John H. Harlan

The marketing of telephone service is subject to the same commercial laws as the marketing of any other commodity, and the same methods that have been found valuable in general are, with necessary adaptation, perfectly suitable for the advancement of the commercial status of the operating telephone company. Retail mercantile establishments have realized for a long time that one of the best methods of cultivating the acquaintance and good will of the public was to invite them in a body to inspect their plant and, in a few cases, operating telephone companies have availed themselves of this very valuable method of advertising their service. It is cheap, it is effective, and it is valuable, because it substitutes in the public mind a definite idea of telephone traffic, investment and operating organization for the hazy ideas that are at the bottom of a large proportion of the foolish complaints familiar to every telephone manager. Public support, backed by a reasonable knowledge of operating conditions, is sure to be more easily retained than public support based on hearsay or on blind local civic pride. Moreover, the public is always deeply interested, and rightly so, in the efforts made to serve it satisfactorily and intelligently.

G. B. Churchill.

The Galesburg Union Telephone Co. of Galesburg, Ill., is an excellent example of the discerning type of operating company, having, since its incorporation in January, 1901, been most successful in securing the enthusiastic support of the public. This is clearly shown by the fact that although this company began operations in March, 1902, with 600 subscribers, it was serving 1,500 in the period of one year, and there was no weakening in the demand for its service.

In 1905 the company had outgrown its plant and a new building was erected for its exclusive use. In this building automanual equipment was installed in 1912. The success of this company is a reflection of the progressive and energetic management which has consistently given the best possible telephone service since the first line was cut into service. The officers are as follows: G. B. Churchill, president; L. Weinberg, vice-president; R. C. Roadstrom, secretary; B. F. Arnold, treasurer; F. C. Woods, general manager.

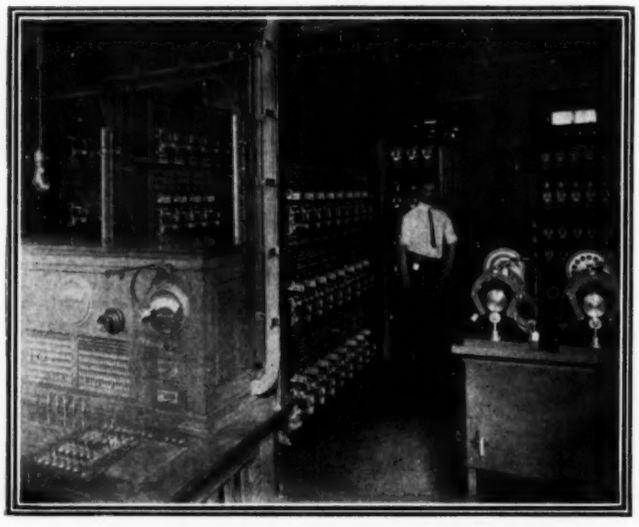
General Manager Woods is a telephone man of the widest operating and manufacturing experience, especially well equipped to carry out the policies of a company

View in Operating Room Showing New Equipment and Old Manual Board.

operating, as his does, in the face of severe competition.

The present Automanual plant is giving service to approximately 5,000 subscribers, connected to approximately 1,800 circuits.

These subscribers are originating 35,000 to 40,000 calls



Connecting Switches and Ringing Machines.

per day, about 90 per cent. of the total traffic of both companies operating in Galesburg. The service is so satisfactory that the Galesburg Union Co. has found it necessary to place an order for an additional installation of Automanual, which will be available for service in a very short time.

Beginning on December 18, and continuing until the evening of December 20, the company held open house for friends and patrons who had the opportunity of listening to a thorough explanation of the Automanual system with the Galesburg installation as the concrete example.

Invitations were sent to all the subscribers of the company several days in advance of the meeting, and a wide response was the result. A keen interest was taken in the actual working of the system, and the reception has served well to establish a cordial bond of understanding between the telephone user and the company. Following is a description of the apparatus as the subscribers saw it:

The installation consists of 1,800 lines distributed into 18 apparatus "bays" one hundred lines to each. Associated with these 18 subscribers' "bays" are others of the same general appearance and construction, on which are mounted the switches for the operators' "key sets;" the switches for the P. B. X. trunks, which are "grouped" or "common numbered;" the relays for the universal board, and switches for increasing the service facilities for any desired group of subscribers' lines.

Each subscribers' "bay" contains the line and cut-off relays for 100 lines and 10 complete connecting trunks, each trunk comprising one "primary switch," one "first selector," one "second selector" and one "connector," associated with which is one party line ringing current selector switch. This arrangement of the ringing current selector switch with the connector enables any call, whether for a party line subscriber or an individual line subscriber, to be handled through any "connector," so that any line in the system may be used for either class of service without special arrangement of numbers or apparatus.

The Automanual system makes use of the transfer principle in completing a call; first switching the call to the group of thousands, then to the group of hundreds in the selected thousand and lastly to the tens and units in the hundred selected. The character of ringing current to be employed is determined just prior to the selection of the tens digit of the number called for.

The subscriber, by removing his receiver, closes the circuit through a line relay which is associated with a cut-off relay in the same way as the line and cut-off relay are associated in manual equipment. The Automanual line relay, however, unlike its prototype in the manual switchboard, does not close the circuit through a line lamp, but closes the energizing circuit of the control apparatus common to 100 lines served by the "bay" in which the calling line is found. This control in turn starts the operation of a "primary" switch, which continues in motion, first in the rotary sense, testing to locate the group of ten lines in which the calling line is found, then in a vertical sense, testing to locate the individual line in the selected group of ten.

At the same time the operators' "key set switch" is started testing in a rotary sense for the "bay" in which the calling line is located, and then in a vertical sense testing for the "primary" which is serving the call. When the operation outlined is taking place a simultaneous selection is testing for a disengaged "key set" located on some one of the operators' positions. The completion of these operations, which are practically simultaneous, places the call before the first available operator for attention.

The operators' "key sets" are grouped in sets of three to each position, a total of thirty-three "key sets" having been originally installed. But this number was installed to handle the abnormal traffic load incidental to cutting over, and experience has since demonstrated that not nearly so many are required, four or five operators on duty at the local positions being easily able to handle any traffic conditions that arise.

Each "key set" consists of three lamps, five rows of buttons, ten in each row, one answering button and one starting button. When a call lands on a "key set" one of the three lamps receives current and remains lighted until the answering button is operated, when it is extinguished and another lamp, known as the "answering lamp," is lighted. The operation of the answering button places the operator's telephone in circuit with the calling line and, when the calling subscriber's order has been taken, the operator sets up the called number on the "key set," depressing each button as she repeats its digit to the subscriber, and operates the starting button, which extinguishes the answering lamp and lights the guard lamp, the latter being equipped with a red opal.

This is the extent of the operator's labor in handling the call, the actual connecting of the lines being completed by the automatic switches and the called subscriber's bell being rung intermittently through a mechanically controlled ringing circuit associated with the operation of the "connector" switch until he answers, or the calling subscriber replaces the receiver on the hook. When the operation of building up the call is completed the guard lamp is extinguished, the "key set" is disconnected and is ready to receive another call.

In each "key set" there are four strips of keys numbered from one to naught, or 10, and one strip of 10 buttons lettered to correspond to the party line designations used. In brief, each horizontal row of buttons is connected with a common wire, which through the arrangement of the apparatus will deliver as many impulses as would be indicated by its position in the vertical row. That is, the first buttons in each row will connect a common wire, which determines that one impulse shall be delivered to the switches, the fifth button when depressed will determine that five impulses shall be delivered and so on. The vertical rows are switched into the circuit in succession

as the call is being built up. The selection of the character of ringing current to be employed is controlled in the same way, the proper number of impulses for the ringing current selector being fixed by the button which has been depressed in the row lettered to correspond to the party line designations.

By relieving the operators from the operations of ringing, disconnecting and supervising their work is very much lightened, and it is a very interesting fact that these operators are said to have no difficulty in handling 800 to 1,000 calls per hour with this equipment.

The chief operator's desk was found to be equipped with "key sets" enabling her to assume a part of the exchange load in case a sudden peak should render it necessary for her to do so. On this desk there were also duplicates of all the calling and answering lamps found on the operators' positions, these lamps being connected in parallel with those on the operators' positions, rendering the supervision of their work very simple.

Associated with each "key set" is a mechanical counter, mounted on the chief operator's desk and so connected that it records electrically all calls served by the "key set" to which it is wired. The taking of a "peg count" resolves itself into the very simple matter of noting the readings of these counters for the desired period.

The information operator's desk, in addition to the usual trunk circuit jacks, is equipped with jacks for the universal board. This is used for handling calls for subscribers whose numbers have been changed, for observing and kindred purposes. When a subscriber's number has been changed, the line to which his telephone was connected before the change is bridged to the tuned relay of the universal board, a relay tuned to the same party line frequency as his former telephone number being selected for the purpose. The line circuit connected with this tuned relay is extended to a jack on the information operator's desk and, associated with this jack is a lamp controlled by the local contents of the tuned relay. When the old number is called the connection is handled in the usual way by the operator that answers, but the ringing current, instead of ringing the called subscriber's bell, actuates the tuned relay, flashing the lamp associated with the jack on the information operator's desk assigned to his telephone. The information operator answers by plugging in the jack and communicates the new number to the calling subscriber. The line is retained on this jack until a revised directory is issued, or until no further calls are received for the old number. Obviously, this lends itself particularly to change in numbers of party line subscribers' numbers.

Toll Board in New Exchange of Galesburg Union Telephone Co.

The wire chief's desk is equipped with lamps and listening circuits for each "primary" switch, enabling him to supervise the operation of the switches without leaving his desk. There is also the usual testing equipment, including a testing voltmeter reading directly in ohms, as well as the usual scale of volts.

Service to P. B. X. exchanges having trunk lines "grouped" is handled by means of extra "second selectors"

and special "connectors." A row in the "first selector" banks is set aside for these lines, so that a call for any of them is, to all intents and purposes, a call into another thousand. Connected with this row in the "first selector" banks is an equipment of "second selectors" whose bank contacts lead to special "connectors." These are regular, except that they are wired to test as many lines as there are in the particular group called for before sending back a busy signal to the calling subscriber. Their bank contacts are regularly divided into groups of five lines for each group, so that all P. B. X. numbers end in either one or five. Incoming calls from the P. B. X. exchanges to the main exchange are handled through the medium of the regular line equipment on the subscribers' "bays."

The current for the operation of the exchange is supplied from two sets of storage cells, each set containing 21 cells, delivering current at approximately 42 volts. A General Electric mercury arc rectifier is provided for charging, with a gasoline engine outfit for reserve.

The toll switchboard is provided with a multiple of all local lines, the toll traffic being confined to the toll operators instead of being merged with the local automanual traffic, as is customary in other plants where toll trunks from the toll switchboard to the local telephone exchange are used.

When this latter method is used, the toll operator, by plugging in a service toll trunk, originates a call which is distributed to the local operators in the same way as a subscriber's call and is handled by the local operator in the same way. After the toll conversation is completed, and the subscriber replaces his receiver on the hook, all switches are released, leaving his line clear. The toll trunk switch is restored to normal when the toll operator removes the toll board plug from the service trunk jack.

More About Character

It Can be Improved—Our National Characteristics

By J. C. Kelsey

A famous financier has recently said that "character is the basis of credit." His remark has created wide-spread discussion.

What is "character" anyway? Napoleon once heatedly said that "no man ever changed his character or his temperment."

Surely the great winner of battles was very wrong. If we were so that no character could be changed, we would be a helpless people. We would practically be fatalists!

As one grows older, he can see his imperfections, follies and weaknesses so much more plainly. He is disposed to improve himself, to be more charitable and less inclined to make a fool of himself. What is more reasonable than to assume that men can change their character?

Character comes from a great word, meaning to engrave. Naturally, when a man speaks of "engraving" he has in mind something firm or hard, like steel. One could engrave upon butter, but it would not give a true conception of engraving.

It simply means that questions of character involve some firm substance upon which to make an engraving. Character is what we engrave upon ourselves.

If we are firm, steadfast or hard like steel, then we have something worth while. If one is as putty, pliable and soft, it is plain that the engraving job is hardly worth doing.

That is what Mr. Morgan meant when he said that "character is the basis of credit." A man who has engraved something worth while and durable upon himself is the man who can be trusted. What is more reasonable, anyway?

To say *you will do a thing, and then do it, that is character!*

To start on something new and never finish it, and turn from one thing to another without completion, that is utter absence of character, like engraving upon butter.

If you were a judge of men, and had stewardship of money, which man would you choose? The man of character, of course!

Mr. Morgan meant that men who always finish what they set out to do, are the ones who are most liable to get the money to set out to do other things.

No man ever taught the world a finer lesson. Every man who feels that he has not succeeded can find a reason and a remedy. If he would search his past, he would find deeds undone, things he started out to do and did not. It would explain the failures of millions of men!

Character makes men undertake things, colossal or otherwise, and follow them from day to day, early and late, and always to the bitter end.

A man with character will listen to others. Do you do that? He will weigh the opinions of others and listen to their advice before deciding for himself. And the best test of character is the man who will profit by the experience of those who have gone before. Does that include you?

A man with character has energy, persistency, honesty, moral courage, true consistency and a keen sense of justice. Every one of these characteristics are simple ones, and within the reach of every individual.

A man with character is not supremely selfish, and his pathway of success is not strewn with the wrecks of peoples' hopes ruined by him.

Do you wonder, now, that character is at least a basis of credit? Can't you see that the great financier has shown all of us a simple pathway?

To have credit, you must have character. To have great credit, you must have character in the same proportion. To make your character greater you must work harder, in whatever walk of life you may be.

All this sounds pretty much like Sunday school, but it is not idle talk.

The greatest financial genius in the world has endorsed it, not idly, but seriously. You must listen; you must have character enough to weigh his opinion.

We hear men constantly exclaiming that their own children will find the struggle for existence much harder than we have found it. I do not agree with any man that conditions today are more difficult than those of former generations.

Life, today, is much more easy and comfortable than it was to the early Kentucky pioneers, for instance.

In those days, individuality counted for everything. Ninety men out of a hundred have no individuality at

all. They could not exist were it not for corporate conditions today.

Yet, if it is true that our economic conditions are changing so as to throw a burden upon our children, what more need we do than to give them character, whose characteristics such as energy, honesty and persistency are so easily cultivated?

In other words, no man can predict disaster for his children if he has equipped them with character.

I have always hated mushy talk, especially from some Sunday school superintendent who was a known commercial failure. I heard a great deal of it in my day. I did not know then that Sunday school teachers were really teaching us fundamental principles of economics. They did not know it themselves.

But a great financier has shown us that it is true. We must believe it, if we give heed to some of the best advice ever given.

I have talked so far about individual character. What about our National character?

We are tolerant and reasonable. We do not take one another too seriously. We have a great sense of humor. And we do not doubt our ability, at any time, to correct a wrong or meet a great emergency.

That is why the public looks upon seemingly important affairs in such a cool-headed way.

The public seems to go on the policy of giving crime or conspiracy enough rope to hang itself, knowing full well they can hang if it is not done voluntarily.

Look about you for the proofs. Agitation and denunciation seemingly fill the air. We hear much about needed reforms. We have seen great abuses go on for years, seemingly no one's business to correct.

Yet today, you have seen the Standard Oil Co. rebuked. You have seen the revelation of the New England railroad monopoly, and a great pressure of public opinion, insisting that roadbeds be improved instead of money being spent on buying out competitors.

You have seen Wall Street under scrutiny and you learned, too, what you expected to learn. You have seen the time right here, when such an agitation has harmed every business house on Wall Street.

They must get right with the people or go broke. See the infinite patience of the public. They did not get excited. They merely quit dealing on Wall Street!

No people on earth must be dealt with so fairly. Nobody but a fool will try to take great liberties with the people. It is a fact that Wall Street has done so.

Now they are clamoring for safeguards to be thrown around their business, just as public service corporations have welcomed state commission rule. They need some one to vouch for their fair dealing.

The New York Stock Exchange must develop its character and demonstrate it to the American people, before it can go on. It needs character just as much as the individual.

The individual practically puts money in Wall Street's hands. Wall Street should have character enough to deserve the credit.

It is a poor rule that will not work both ways. It is like a contract which will become invalid if its terms are not just to both parties.

We have seen the dynamiters at Leavenworth, and also the disgrace of the labor unions, of Chicago, condemning the judge as "biased" and the jury as "fixed."

We have seen the Idaho courts send men to prison for contempt. And have seen an ex-president openly defying them. We have seen the scandal in the New York police. Yet it was quelled in a short time.

We have agitators and reformers in every walk of life, some of them revolutionary. It is a mystery why we should have so many social and political false prophets. We have them by the thousands.

Yet the great army of the public moves on quietly and solemnly. People still work hard, and as much good work is done as formerly. We still have hope and ambition.

From what we hear, one would think that everything is going to the dogs, but it is not true. We still have the courts interpreting the constitution, as of old. Our property is still safe. Our laws are in no great jeopardy, as long as we do not seek trouble of that kind.

Look about you! You will see an orderly people, tending to business, and moving along on the even tenor of their way.

It is the character of the American at large. He is good-natured, but is merciless indeed when great wrong is done.

That is why any person who hopes to save this country by violence of any kind, must make up his mind to save it according to law.

Public opinion is suspicious of the reformer. It will accept no reform until it is ready for it. It treats one disease at a time. And, in our one hundred years of existence, has never gone on a stampede.

A man with character has little to worry about. Neither has a nation.

We can all depend upon it that this country is growing better, and because we want it to do so. It is a necessary economic step.

The people can discipline anything and bring it to its knees. They need have no fear of ultimate trust slavery, any more than of human slavery.

Human slavery was an evil, and a gigantic upheaval tore away its chain for all time. That is exactly what will happen to trusts if the human management can not see when to let good enough alone.

The French Revolution was a good sample of early day revolution. But the public revolution of today is more effective and much more merciless.

I have spoken of character as applied to individuals and to the nation.

In our own telephone business, we have always heard of the word "quality." Well, "quality" means "character."

The Independent telephone business at large need not be ashamed of its character. It has set out to do things and has done them. We have seen wonderful examples of moral courage, persistency and honesty.

No other business on earth pays its bills as promptly as the telephone. No institution ever started where persistency and moral courage were more greatly needed, and where they were given fuller exercise.

These characteristics are not confined to Independent telephony exclusively. The Bell companies lately have been more willing to listen and heed the lessons of experience. I never heard a more sane thing than the statement credited to President Gentry, of the Southern Bell company, that the courts were a poor place to discuss telephone rates.

He referred directly to the Louisville case, and insisted that the difference of opinion in Louisville be settled on its merits in a friendly way.

But his statement reveals a broad spirit, and it opens up a line of thought worth while. That statement took considerable moral courage, which is a part of the stone wall of character.

I was much interested in a Postal article called "An English View of American Men." The article is really a character study.

There is an assumption that great stock companies cause deterioration in the fibre of men, as compared to those who own their own business; that corporate work makes men ciphers, and not men of responsibility and of resource, as private enterprises would necessarily make them.

A great railroad, for instance, can not be owned by one man. It rarely happens that the principal owners are presidents.

The Pennsylvania Railroad is not only the greatest railroad in the world, but is the most important industrial private enterprise in the world.

No private owner ever controlled it. It operated exclusively by paid officers. There is $2,000,000,000 worth of property controlled by hired men. And, through three generations, leadership has been strengthened instead of being weakened.

I do not believe in any such theory—of a weakening process. Responsibility makes men. It accounts for the fact that in every seeming crisis, a man arose who could handle it.

I believe the greater the corporation, the greater will eventually be developed the character of its leaders.

You have heard that the Civil War would have been a failure had not Lincoln been given us providentially. That is a mistake! Lincoln was a wonderful man and acquitted himself divinely. Yet I believe that almost every president we have had would have done likewise.

I have noticed that even a mediocre lawyer can make an excellent judge. The man really rises to his responsibilities. He really changes his character.

The newly promoted general manager in a few days makes you wonder why there had not been such a change years ago. In other words—the back is made to fit the burden.

MORAL: Say you will do it, and then do it!

New Telephone for Mine Rescuers Being Perfected.

The newest apparatus being tested by the experts of the United States Bureau of Mines at the Arsenal station is a telephone by means of which conversation is transmitted from the outside of the throat instead of from the mouth, states a writer in The Coal Trade Bulletin. The new telephone, although not yet given official approbation, has been undergoing a series of tests at the laboratories of the Bureau of Mines and is regarded by its experts as a most efficient solution of the problem of insuring verbal communication between the rescuer in the mine and the outside men when a mouth-breathing apparatus is used.

The recently adopted mouth-breathing apparatus, which, it is declared, will soon take the place of the oxygen helmet now used in rescue work, gives the operator no freedom of the lips. Conversation by means of the telephone now used with the helmets is thus made impossible. The transmitter of the newly devised telephone comes in direct contact with the vocal organs. By this means speech may be intelligently conveyed from the rescuer in the mine to the outside simply by the vibrations of the vocal cords. To overcome the difficulty encountered in the imperfect transmission of consonants, such as *p* and *m*, pronounced by means of the lips, a numbered code of words will be adopted. The receiver of the telephone is strapped over the rescuer's ears.

Another advantage demonstrated in the use of the telephone is the possibility of its usefulness to others of a rescue corps when the rescuer meets with accident. Whereas the telephone transmitter used with the oxygen helmets is inaccessible to others than the rescuer without the removal of the helmet, the transmitter of the new telephone is separate from the mouth-breathing apparatus and can be used by fellow-workers by simply removing it from the throat of the one to whom it is originally strapped. In this way word can be sent to the outside reserve corps of accident to the man who entered the mine with the telephone.

A code system for use with the telephone has not yet been adopted, but it is asserted that soon the instrument will have been perfected, a code adopted and its use insured in the mine rescue work.

Telephone Efficiency.

A certain waste in the use of the telephone can be eliminated if the practice of "leaving messages" be more generally followed states the Bulletin of The Efficiency Society.

When an immature voice answers that your party is not in and asks if you will leave any message, don't merely give your name and ask your party to ring you up when he comes in. In the first place, you may be out when he calls you, and then two telephone messages have been wasted. In the second place, no man likes to be told when he comes into his office that Smith and Jones and Brown want him to call up, for reasons that he doesn't know and probably doesn't care about. He is not likely to hurry to do it. But if you have left a message, in nine cases out of ten he will immediately call you up, if only to be sure that he has the message straight. And, if you happen to be out, he has the basis for leaving a reply to your message.

An Unnoticed Competition at the Olympian Games.

At the Olympian games held at Stockholm, Sweden, last summer there was competition between the various teams inside the stadium. Outside the walls of the stadium there was competition of another kind, that between the Govern-

Booths of Competing Telephone Companies at Olympian Games.

ment and the Independent telephone systems. The booth of the Rikstelefon or Government system is shown in the foreground of the illustration, and that of Stockholms Telefon or competing system appears on the right.

There were a large number of these booths scattered around the athletic place. They were evenly divided between the two competitive telephone companies and were extensively used during the meets.

La Crosse Independent Shows Gains For Fiscal Year

Wisconsin Company Issues Annual Statement for Year Ended June 30, 1912—Records Over 13 per cent. Gain in Stations—Gross Revenue was $64,776; Expenses, $37,264; Net Earnings, $27,512—Depreciation Appropriation for Year was Over $13,000

The La Crosse Co., of La Crosse, Wis., has issued its annual report for the fiscal year ended June 30, 1912.

The figures show gross revenues of $64,776 and expenses, not including the allowance for depreciation, of $37,264. Net earnings were $27,512. The depreciation appropriation for the year was $13,362.

A net gain in stations was registered of 481, or over 13 per cent. The total number connected at the close of the fiscal year was 4,098, as compared with 3,617 on June 30, 1911.

The statement showing the growth and distribution of telephones connected with the system during the year is as follows:

TELEPHONES IN USE.

	June 30, 1912.	Installed during year.	Disconnected during year.	June 30, 1911.	Net Increase.
Business Telephones—					
One-party	271	33	32	270	1
Two-party	64	12	13	65	*1
Four-party	473	98	75	450	23
Extensions	51	23	22	50	1
Residence Telephones—					
One-party	45	11	11	45	..
Two-party	167	42	35	160	7
Four-party	2591	871	463	2181	410
Extensions	17	11	9	15	2
Answering sets	55	24	31	62	*7
Operators	21	12	12	21	19
Rural Telephones	113	46	27	94	19
Switch boards	2	..	..	2	..
Private branch exch. tels.	128	25	20	123	5
Trunk lines	32	5	2	29	3
Pay Stations	11	..	8	19	*8
Employes	31	3	2	30	1
Miscellaneous	26	25	..	1	25
	4098	1243	762	3617	481

*Decrease.

This shows a net increase in telephones during the year of 481 telephones, which represents an increase in revenue of $541.91 per month, or $6,502.92 per annum.

On an increase during the year of 481 telephones it may be assumed that this would be equal to 240 telephones installed for the whole year, and this added to the telephones in use on June 30, 1911 (3,617), would give the average number of telephones in use during the year as 3,857.

The income account for the year ended June 30, 1912, was as follows:

INCOME ACCOUNT.

Year Ended June 30, 1912.

	EXCHANGE Amount	EXCHANGE Per Station	Toll System
Operating Revenues—			
Telephone rentals	$61,354.66	$15.910	
Exchange connection earnings	180.00	.046	
Toll Connection earnings	1,179.88	.304	
Miscellaneous exchange earnings	848.20	.219	
Toll system earnings	.....	...	$1,214.85
Total operating revenues	$63,562.74	$16.479	$1,214.85
Operating Expenses—			
Central office (traffic)	$12,069.00	$ 3.130	
Wire plant (transmission)	4,010.17	1.040	$ 32.06
Substation (terminal)	4,971.74	1.290	
Commercial	3,539.64	.917	305.78
General	7,413.67	1.922	
Undistributed	2,941.99	.763	
Depreciation	13,362.36	3.464	258.60
Taxes	1,692.01	.438	30.38
Total operating expenses	$50,000.58	$12.964	$ 626.82
Net operating income	$13,562.16		$ 588.03
Exchange—Net operating income equal to per station		$3.515	$13,562.16
Toll System—operating income			588.03
Add—			
Profit on merchandise sales	$629.63		
Wiring and installation work	16.55		
Miscellaneous non-operating revenues	116.50		
Discounts	290.06		
Interest received	102.00		
			1,154.74
Gross income			$15,304.93
Deduct—			
Interest paid on bills payable			1,305.78
Net income			$13,999.15
Dividends Paid—			
Preferred stock	$7,514.79		
Common stock	4,000.00		
			$11,514.79
Surplus for year			$ 2,484.36
Surplus at beginning of year	$6,313.53		
Adjustments—			
Utility equipment	$ 205.80		
Removal expenses	3,965.18		
		$4,170.98	$ 2,142.55
Surplus June 30, 1912			$ 4,626.91

The balance sheet at the close of the fiscal year, June 30, 1912, was as below:

BALANCE SHEET.

As of June 30, 1912.

ASSETS.

Capital Assets—		
Organization		$ 112.00
Land		6,000.00
Buildings, fixtures and grounds		48,843.00
Wire plant construction and equipment		136,017.72
Substation equipment		52,633.10
General office equipment		3,201.28
Stores department equipment		9.35
Utility equipment		3,064.57
Current Assets—		
Cash in bank	$ 415.65	
Notes receivable	1,700.00	
Accounts receivable	1,685.55	
Materials and supplies	8,320.79	
Prepaid directory	410.34	
Prepaid insurance	188.39	
Prepaid rent	135.00	
Prepaid insurance (automobile)	42.00	
		12,897.72
Total assets		$262,778.74

LIABILITIES.

Capital Stock Issued—		
500 shares common stock		$ 50,000.00
2435 shares preferred stock		121,750.00
		$171,750.00
Depreciation reserve		58,782.24
Employers' liability insurance reserve		200.00
Current Liabilities—		
Notes and bills payable	$26,400.00	
Taxes accrued	819.55	
Interest accrued	200.04	
		27,419.59
Surplus		4,626.91
Total liabilities		$262,778.74

The directors of the company are: I. H. Moulton, president; Henry Gund, vice-president; F. P. Hixon, George H. Gordon and L. C. Colman. W. F. Goodrich is secretary, treasurer and general manager. J. M. Storkerson is superintendent.

Keeping Records of a Telephone Company's Physical Plant

Description of the System in Use by the Illinois Telephone & Telegraph Company—Complete Record of Wires from the Telephone Exchange to the Subscribers' Station—Underground and Aerial Cable Distribution and How Handled

By J. F. Ellwanger

The layman in walking along the streets, observes a line of poles, carrying cross arms, cables, wires, etc. But aside from the fact that these objects are in some way identified with his telephone service, they evoke no further thought. To the telephone man, however, each object bears a definite significance as a part of the physical plant of a very important organization. Of this organization the record division forms a part of no small importance.

It is essential that every integral part of the physical telephone plant be identified in a complete system of records. These must at all times be accurate and in tangible form, for the economy of construction and maintenance depends largely upon the accuracy of these records.

Generally speaking, there are two classes of telephone construction, namely, underground and aerial, and the system of records governing each class differs somewhat from the other.

In Fig. 1 is reproduced a record card which shows the record of a subscriber whose service is derived through the underground system, as, for instance, a subscriber located in a large office building, which has cable distribution at each floor. This underground system is so arranged that the service cable coming from the exchange is terminated on a strip in a large terminal box in the basement, which, for example, may be marked "Strip A."

In this same basement terminal box is another strip, which may be marked "B," on which terminates the cable which distributes to the various floors of the building. By cross connecting a pair of conductors from strip *A* to strip *B*, a continuous circuit is established from the telephone exchange to the floor of the building on which subscriber is located.

In Fig. 2 is shown a diagram explaining the record shown in Fig. 1. *K* represents the exchange cable which terminates on one side of distributing board at the exchange. The service cable *A* is a branch from the main exchange.

Form 606 SM 11-1-12

CIRCUIT CARD

Tel. No. 32-468		Contract No. A 3214	
Name Williams & Porter.			
Address Strauss Bldg., R. 1012.			
Classification M.L.Bus. Brokers.			
Equipment Desk Set.			
Exchange Cable No.	K	Pair No.	101
Service Cable No.	A	Pair No.	1
Service Cable Term. at			
House Cable No.	B	Pair No.	1
Sub. Term. Box 10TH	Floor	Pair No.	1
Date in Service 5-21-12		Date Taken Out	
Remarks			

Fig. 1. Record of Subscriber Served from Underground System.

cable, *K*, which feeds the building in which subscriber is located. The house cable, *B* terminates on a strip in the basement terminal box and distributes to the various floors of the building.

Some telephone companies in their record systems ignore that portion of a conductor assignment which affects the house cable. As a consequence, the telephone installer whose working order covers only the service cable terminating on strip *A*, must consume some of his own time, and possibly that of a helper, testing out the house cable

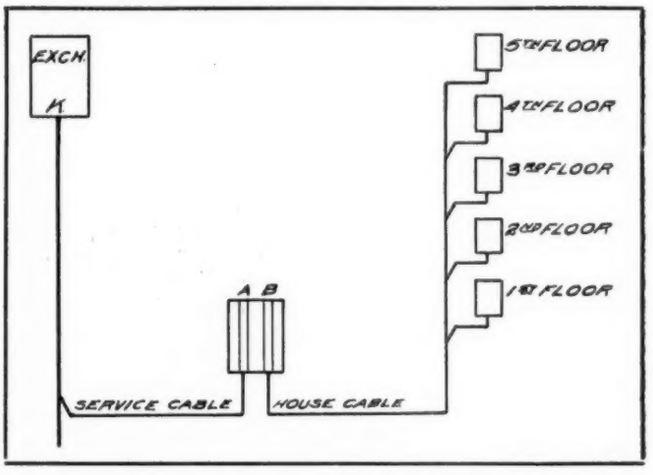


Fig. 2. Divisions of Cable, as Used on Subscriber's Record.

to ascertain an available pair to the subscriber's floor. In so doing he usually does not follow any systematic method of cross connecting from strip *A* to strip *B* in the basement terminal box. This practice is not only expensive, but a source of annoyance to the operators and subscribers, as the installer disturbs the lines while testing for a pair. This annoyance is repeated every time a repairman has to visit the basement terminal box, for he too must trace out the cross connection, and in so doing disturbs the service.

Such confusion is eliminated by use of the record system shown in Fig. 1, as the working orders of both installer and repairman are compiled according to these card records. They show the subscriber's conductor assignments on both strips *A* and *B* in the basement terminal box, or, in other words, from the exchange distributing rack to a specific pair of conductors in the house cable terminal located on the subscriber's floor.

A service cable record sheet is shown in Fig. 3, the cable feeding the Strauss Building, Chicago, being taken as an example.

The service cable in this instance is a 100-pair cable, branching from the 400-pair exchange cable *K*. It is comprised of pair conductors Nos. 101 to 200, inclusive, of cable *K*, and terminates on strip *A* in the basement terminal box, as shown graphically in Fig. 2.

Under the heading "Connected to," reference is made to the pair assigned in the house cable which terminates on strip *B* in the basement terminal box.

Fig. 4 represents the cable record sheet for the house cable which distributes from strip *B* in the basement terminal box, to the junction boxes on the various floors of the Strauss Building. On this card the heading "Connected to" refers to the pairs assigned in the service cable. By referring to either of these sheets it is immediately

apparent which pair of the service cable is cross-connected to a given pair in the house cable and vice versa.

It will be noted that under the heading "Room No." in Fig. 4 are shown some room numbers without a telephone number assigned under the head "Directory Number." This indicates that the room has at some previous time been wired for a telephone, which may have been removed through cancellation or the removal of the occupant to some other address. In such a case the records clearly indicate that no further installation of wires from the floor box to that particular room will be necessary, thus avoiding duplication of labor and material in the event of a new contract for telephone service to that room.

Aerial construction is in reality a combination of underground and aerial constructions. The main exchange cable is underground and its tributaries are brought to the surface through lateral pipes attached to poles in streets or alleys. From these points the cables run aerial and terminate in cut out boxes placed on poles at intervals along the pole route. From these cut out boxes, distribution is completed by aerial wires.

Fig. 5 shows the record card of a subscriber who derives service by aerial distribution. In this particular case, *M* represents the exchange cable terminating at the exchange distributing rack. It has 600 pairs of conductors, 50 pairs of which branch from the main cable and run aerial through various alleys, terminating at intervals in 15-pair cut out boxes. The terminal described on the card is located in the alley, east of Indiana Ave., the fourth pole south of 33rd Street. From this cut out box, service is supplied by loose wires to the subscriber's station.

The cable record sheet Fig. 6 covers conductors pairs Nos. 1 to 100 inclusive of the 600-pair cable *M*. Under the caption "Distribution," may be found the cut out box for the "Alley east of Indiana Ave. fourth pole south of 33rd Street," described on the subscriber's record card, Fig. 5. It will be seen that this cut out box has 15 pairs of terminals, pairs 1 to 5 of which represent pairs Nos. 1 to 5 of the main cable *M*. Pairs 6 to 15 of the terminal box are connected to pairs Nos. 11 to 20 of cable *M*. The small crosses indicate the cut out box from which the loose wire distribution is made. In Fig. 6 is shown the method employed in connecting cut out boxes in multiple, so that the same pairs of cable *M* may be available at several points.

CABLE No. M — CHRONICLE EXCHANGE

SIZE 400 PAIR

DISTRIBUTION					DISTRIBUTION				
		STRAUSS BLDG.	CONNECTED TO				STRAUSS BLDG.	CONNECTED TO	
PAIR NO.	DIRECTORY NUMBER	A	CABLE NO.	PAIR NO.	PAIR NO.	DIRECTORY NO.	A	CABLE NO.	PAIR NO.
01	32-468	X1	B	1	151	31-907	51	B	54
02	31-877	2	B	26	152		52		
03		3			153		53		
04	31-883	4	B	72	154		54		
05	34-051	5	B	32	155		55		
06		6			156		56		
07		7			157	34-367	57	B	3
08	31-649	8	B	43	158	31-942	58	B	13
09	32-466	9	B	12	159		59		
10		10			160		60		
11	31-006	11	B	21	161		61		
30		30			180		80		
31		31			181		81		
32	33-246	32	B	15	182		82		
33		33			183		83		
34		34			184		84		
35		35			185		85		
36	36 123-323 / 223-423	36 PARTY LINE	B 51 / B 13	B 51 / B 13	186		86		
37	34-145	37	B	74	187		87		
38		38			188		88		
48	34-294	48	B	42	198		98		
49	31-604	49	B	67	199		99		
50	32-599	50	B	23	200 S	32-366	100	B	62

Fig. 3. The Service Cable Record Sheet.

It will be noted that each cut out box is numbered from 1 to 15 irrespective of the pair numbers of cable *M*. This

Form 606 5M 11-1-12

CIRCUIT CARD

Tel. No. 74-662 Contract No. A 2771

Name Robinson, William C.

Address 3334 Prairie Ave.

Classification M.L.Res.

Equipment Desk Set.

Exchange Cable No. M Pair No. 1

Service Cable No. M Pair No. 1

Service Cable Term. at AL.E.OF.INDIANA AV.4TH.POLE SO.OF 33RD.ST.

House Cable No. Pair No.

Sub. Term. Box Floor Pair No.

Date in Service 2-16-12 Date Taken Out

Remarks

Fig. 5. The Subscriber's Record Card—Aerial Distribution.

is done so that if it becomes necessary to transfer one or more cut out boxes from one cable to another to relieve congestion and afford better facilities, it will not be necessary to re-stencil them.

It is the practice of some companies to stencil their cut out boxes with numbers corresponding to the pair numbers of the main cable, so that in the event of a transfer from one cable to another, it becomes necessary to re-stencil the cut out boxes, so transferred, to agree with the pair numbers of the new cable. This expense is avoided by the use of the method just described.

The circuit cards which have been described are kept in a "live" file in numerical order, governed by the telephone numbers. In the event of a cancellation these are removed from the live file and placed in a dead file. A complete history of any given number is thus available.

There are various other record systems, such as directory files, location files and general information files, which are merely an elaboration of the system which has been described.

Telephones on the Erie Canal.

For many years that section of the Erie Canal from Lockport extending east of Rochester to a point near Clyde, N. Y., has been the scene of numerous breaks, due to

CABLE No. B

SIZE 100 PAIR

HOUSE CABLE—STRAUSS BLDG.

SERVICE CABLE-STRIP A-CONDS 101-200.EXCH.CABLE-K-

| DISTRIBUTION | | |

underlying quicksands which have weakened the banks, says F. D. Ferris in the Telephone Review. Many fertile farms adjoining the canal property have been partially inundated by the capricious waters of De Witt Clinton's "ditch." A recent break at Bushnell's Basin, a short distance east of Rochester, called for immediate action on the part of Charles McDonough, assistant superintendent of public works, and Thomas Leddy, superintendent of section nine.

On a rush order a private telephone line was speedily established by the New York Telephone Co. between temporary headquarters near the break and the central telephone office at Pittsford. This gave instant communication with the canal offices at Rochester, and by means of toll connections through Albany, numerous contractors in Buffalo, Oswego, Philadelphia and other points were reached, and men, supplies and machinery were dispatched to aid in repairing the break.

As a precaution against further interruption to navigation, and canal authorities purchased and installed a private telephone line along the canal bank. The circuit is 111 miles in length, extending from Lockport to Clyde, N. Y.

The telephone equipment consists of No. 17 twisted pair attached to poles and terminating in magneto wall sets. There are 29 stations located at the various locks and in booths along the banks for the convenience of patrolmen who are on duty at all times. By means of a series of rings the various stations can be signaled.

The telephone also enables officials to keep in touch with and receive reports from employes on the line at any time of the day or night. The line also facilitates the locking of boats as notice of their approach can be telephoned from lock to lock, and the locktender can prepare in advance to handle the boats when they arrive.

CABLE No. M

SIZE 600 PAIR

COTTAGE EXCHANGE

DISTRIBUTION																DISTRIBUTION															
		POLE-ALE. CALUMET & ALN. 36	ALE. CALUMET 4TH. POLE SO. 35	ALE. CALUMET 3RD. POLE SO. 36	ALE. CALUMET 1ST. POLE SO. 35	ALE. CALUMET 5TH. POLE NO. 35	ALE. CALUMET 4TH. POLE NO. 35	ALE. CALUMET 2ND. POLE NO. 35	ALE. INDIANA 4TH. POLE SO. 33	ALE. INDIANA 2ND. POLE SO. 33	ALE. INDIANA 3RD. POLE NO. 33	ALE. INDIANA 1ST. POLE NO. 33			CONNECTED TO			ALE. FOREST 4TH. POLE SO. 31	ALE. FOREST 2ND. POLE SO. 31	ALE. FOREST 3RD. POLE NO. 31	ALE. FOREST 1ST. POLE NO. 31	ALE. PRAIRIE 4TH. POLE SO. 30	ALE. PRAIRIE 2ND. POLE SO. 30	ALE. PRAIRIE 5TH. POLE NO. 30	ALE. PRAIRIE 3RD. POLE NO. 30	ALE. PRAIRIE 1ST. POLE NO. 30					CONNECTED TO	
PAIR NO.	DIRECTORY NUMBER												CABLE NO.	PAIR NO.	PAIR NO.	DIRECTORY NO.													CABLE NO.	PAIR NO.
1	74-662	1						X 1							51	71-622	X 1							1						
2	74-683	2						X 2							52	72-120	2							X 2						
3		3						3							53	72-565	3							X 3						
4		4						4							54		4							4						
5		5						5							55	73-768	5							5						
6	71-538										X 1				56	74-010		X 1						6						
15		10			5			10							65	71-540	X 10		5						5						
16	73-106	11	6			X 1		11			6				66	74-288	11	X 6		1				11						
17	71-438	12	7		2			X 12			7				67	73-929	12	X 7		2				12						
18	73-788	13	8		X 3			13			8				68	72-120	13	8		3				X 13						
19	79 374 X 374-471	14	X 9		4			14			X 9		PARTY LINE		69	77 610-810 510	X 14	9	X	X 4				14				PARTY LINE		
20	77 809 709 509	15	X 10		5	X 1		15			X 10		PARTY LINE		70	74-693	15	X 10		5				15						
21	71-888		11	6							11				71	73-290		11	X 6						6					
22	71-988		X 12	7		2					12				72			12	7						7					
23			13	8		3					13				73	73-948		13	X 8						8					
24	73-099		14	9		X 4					14				74	71-248		14	9						X 9					
25	72-467		15	10		X 5					15				75	72-566		15	10						X 10					
26	72-514		1	X 11	X 6					1					76	72-252			11	X 6	X 1				11					
27	72-515		2	12	7					X 2					77	75 321-421 121			X 12	7	2				X 12		PARTY LINE			
28	72-444		3	X 13	8					3					78	71-256			X 13	8	3				13					
29	74-186		4	14	X 9					4					79	73-180			14	9	X 4				14					
30	74-112		5	X 15	10					5					80	76 528-728 -628			15	10	X 5				X 15		PARTY LINE			
48				13							13				98								13	13						
49	72-946			14							X 14				99								14	14						
50				15							15				100								15	15						
															S															

Fig. 6. Cable Record Sheet for Aerial Distribution.

Bell Buys Marquette County System.

The Michigan Railroad Commission has granted permission to the Michigan State Telephone Co. to purchase the properties of the Marquette County Telephone Co., of Marquette. The system was inventoried and the purchase price set at $85,000.

Northwestern Cedarmen Hold Convention at Duluth

Seventeenth Annual Meeting of Strong Association a Big Success—Nearly Every Member of Organization was Represented—President Bradley, Duluth Being His Home Town, Played the Host Delightfully—Officers' Reports Show Sound Condition.

The Northwestern Cedarmen's Association held its seventeenth annual convention at the Spalding Hotel, Duluth, Minn., on January 7 and 8. Being held in his home city, President Thomas P. Bradley, of the Duluth Log Co., saw to it that the members of the organization had a good time, and all agreed that the "Zenith City of the Unsalted Sea" was a mighty fine place for cedarmen to meet.

Practically every firm affiliated with the association was represented at the convention. The list of members follows:

Bay de Noquet Co., Nahma, Mich., and Chicago; Beaver Dam Lumber Co., Cumberland, Wis.; Curry & Whyte Co., Duluth, Minn.; Clark Pole & Tie Co., Bemidji, Minn.; Cloquet Tie & Post Co., Cloquet, Minn.; Coolidge-Schussler Co., Minneapolis, Minn.; Crawford Cedar Co., Menominee, Mich.; L. K. Deal Lumber Co., Des Moines, Ia.; Duluth Log Co., Duluth, Minn.; Erickson & Bissell, Escanaba, Mich.; Finch Bros., Superior, Wis.; Joyce-Watkins Co., Chicago; Learned Cedar Co., Minneapolis, Minn.; Perley Lowe & Co., Chicago; MacGillis & Gibbs Co., Milwaukee, Wis.; McCulloch & Moss Lumber Co., Minneapolis, Minn.; Martin Bros., Duluth, Minn.; Meloney Bros., Spooner, Minn.; Naugle Pole & Tie Co., Chicago; National Pole Co., Escanaba, Mich.; Pendleton & Gilkey, Minneapolis, Minn.; T. M. Partridge Lumber Co., Minneapolis, Minn.; Fage & Hill Co., Minneapolis, Minn.; St. Croix Pine & Cedar Co., Blackduck, Minn.; I. Stephenson Co., Trustees, Wells, Mich.; W. C. Sterling & Sons Co., Monroe, Mich.; Torrey Cedar Co., Clintonville, Wis.; Valentine-Clark Co., Minneapolis, Minn.; C. H. Worcester Co., Trustees, Chicago; Wisconsin Land & Lumber Co., Hermansville, Mich.; White Marble Lime Co., Manistique, Mich.; Western Electric Co., New York City.

The report of Secretary McKinney was read and accepted. Treasurer W. B. Thomas' report as read showed the association to be in good financial condition.

The address of President Bradley was most interesting, and he was frequently interrupted by applause. He began by humorously declaring that his speech was not written by Herbert Gilkey, and then proceeded to review the work of the past year. He commended the work of the Cedarmen's Exchange, under the management of Robert H. Ross, which has carried out Ernest L. Clark's inter-insurance plan. "Any of our members who are not carrying a portion of their insurance in the Cedarmen's Exchange are missing a good thing," said President Bradley. "I believe Mr. Ross' report will show that the different policy holders will have credited to their account approximately 80 per cent. of the premiums paid and that we have paid all losses with the first fire fund, which is made up of interest on investments, and actually earned premiums on policies that have been cancelled. On insurance we have written in the Cedarmen's Exchange we have paid the same rates we would pay to the other insurance companies, and as about 80 per cent. of the premiums paid stand today to the credit of our respective accounts, this means that our insurance so written has cost us approximately 20 per cent. or about one-fifth of what it would have cost otherwise."

President Bradley referred to the importance of the Interstate Commerce Commission order relating to the investigation of alleged irregularities and discrepancies in the weighing of freight by carriers. Mr. Benham, representing the association, attended the Chicago hearing and obtained much information of value. At St. Faul the cedarmen's railroad committee presented evidence to the commission. Mr. Bradley in his address impressed upon the members the importance of their giving these matters attention and insuring a square deal for themselves. "I hope," said he, "that the time isn't far distant when sufficient pressure will be brought to bear so that open cars must be furnished by the railroad companies properly equipped for loading of poles, or else a provision in their tariffs giving us an allowance of twelve hundred pounds besides the cost of staking and wiring." Reference was made in the address to the death of Gilbert B. Shaw, who passed away April 13, 1912. Mr. Shaw was the senior member of the Naugle Pole & Tie Company.

After four years of slack conditions, President Bradley said, the cedarmen now could expect a good year in 1913. "We are gradually climbing back," said he, "and the outlook for next year's business is very encouraging. Post business for the past year has been about on a par with 1911. The pole business, though, has shown some improvement. At the present time stocks are broken with a marked shortage in some sizes. The tie situation is getting back to where it was a few years ago."

The pulpwood situation was described fully, and the retiring president closed by saying: "And now, brother cedarmen, as I consign to its resting place the last of the Bradley administration, let me express my warm personal thanks for the co-operation and assistance you have given me, and at the same time, bespeak from you pardon for my many errors, consideration for what I have left undone, and loyalty to my successor, whoever he may be. If ever business is poor, if prices drop, if things don't go as you would like, remember the old Western motto: 'Don't shoot the president; he's doing the best he knows how.'"

A report was submitted to the convention showing the following summary compiled from estimates of white cedar to be produced this winter in the three white cedar states, as compared with a year ago:

	Logging Season 1911-1912.	Logging Season 1912-1913.
7-foot posts	11,015,000	10,110,000
8-foot posts	485,000	475,000
10 to 14 foot	181,500	146,500
16 to 18 foot	114,000	95,800
20 foot	345,000	354,200
25-foot and up	835,500	731,300
Total pieces	12,976,000	11,912,800

A condensed summary of white cedar stocks on hand January 1, 1912, as compared with January 1, 1913, follows:

	1912	1913
7-ft. split	604,491	524,241
7-ft. round	3,133,709	4,080,250
8-ft. round	274,247	265,858
10 to 14-ft.	189,208	216,771
16 to 18-ft.	119,338	75,624
20-ft.	605,899	650,604
25-ft. and up	546,655	559,672
Total ..	5,473,536	6,373,020

After a general discussion of the cedar situation the morning session adjourned until 2:30, when reports were made by committees. These reports were followed by discussions by the members. Wednesday the convention devoted to general business. The banquet held in the evening marked the close of the convention and was a success in every particular.

The "Me'n You" described the opening stanza of the

banquet—a cocktail—in a more or less involved manner, but not so involved as to worry the diners. This was followed by: "Swamp Water" (from Beaudette), Fine Old Dope! (almost as scarce as 6-in. thirties), Remnants (from the 'fish-fry' at Black Duck Lake), More Dope!! (Cheer up, boys, the worst is yet to come!), The Bachelor's Delight (married men, hands off!), The Real Dope!!! (Some class to this, what?), Choice Sections of a Deceased Cow (from 'Kirk's' farm), Butt Rot (with creosote on the side), Slashings (to be burned in accordance with the Minnesota state law)."

The report of the secretary was as follows:

"The bulk of the secretary's report for the year 1912, has been handed you this morning in the shape of statistics covering stocks on hand January 1, 1913, in aggregate, and also in Michigan, Minnesota and Wisconsin, with shipments out for the year 1912. So few members contributed to these reports that while they give us a line up on the situation, they are not entirely satisfactory and I will endeavor to issue more complete reports later. You will note, however, that with one or two exceptions they cover the heaviest of the individual stocks and shipments. No doubt the meeting coming so early in the year has made it hard for some members to make up their reports, but this year it was the big operators that were in on time.

In order to get annual reports showing the true state of affairs, we should either have our annual meeting come later in the month or base our individual reports on an earlier date than January 1. This is the time of the year that we really want a correct report of the situation.

If our estimated production for the winter of 1912-1913 is a close guess, about the same amount of stock will be put in this season as a year ago, the only great difference being on the 7 ft. Our stock reports show last winter work was not overestimated, but under, if anything. We get a stock on hand report July 1 and then, for the next four months, check it up against the shipments. Every indication is that January 1 will find stocks very much under the year before, especially in the pole departments, but when the reports come in January 1 as they did this year, with several stock reports missing, we find on hand almost a million more 7-ft. posts and more poles in almost every size and length with the exception of some of the longer poles of special sizes.

If we could get our regular reports each month from all the members and not from the same faithful few, the aggregate stock movement reports would be very much larger at the end of the year.

A year ago the secretary was instructed to issue monthly a report of prices being quoted to the trade. This has been done regularly, but for several months the quotations have not been numerous. This report is not receiving the attention it should, especially from the pole men.

We had 22 calls for inspection during 1912, 13 being pole and nine post disputes. Of the inspections 16 were made by the secretary, the balance being so far away from Minneapolis that inspectors were furnished from more convenient points. These disputes have all been brought to a satisfactory settlement.

Our register of commission men handling stock for the members has been brought up to date and the members reporting informed when a man was registered by more than one member, as selling for them on commission. The question of the amount of commission to be paid was taken up with the members by letter and the replies were almost unanimous in fixing the limit of $5 per car. There was some difference of opinion regarding commission on double loads.

The Bemidji Weighing Association, while not wholly composed of members of the Cedarmen's Association, is handled through the secretary's office. During the year ending December 1, 1912, 3,995 cars were weighed and reported to the members. The cost for this was about 25 cents per car. Our weighmaster formerly went to the scale house when the cars were weighed and saw that weighing was properly done, and reported conditions which might influence the weight of the car.

The scales at Bemidji were put under the control of the Western Railway Weighing & Inspection Bureau last June, and while they were willing to allow our men to be at the scale house to watch the weighing, W. H. Gemmell, general manager of the Minnesota & International Railway, has refused him admission to the yards or scale house. The weights now reported by our man are those given him by the agent at Bemidji. About the only advantage in this is that you get some sort of a weight report sooner than any other way.

I would suggest that steps be taken at the present session of the legislature to secure the enactment of a law giving the State Railroad and Warehouse Commission the same authority over the weighing of lumber and forest products that it now has over grain, hay and coal.

We still have on hand about 150 of the Rexton freight rate books issued August 1, 1911. The changes in rates to the present time have not been numerous, but the members may desire a new issue covering more territory and also a rate based on some other point besides Rexton.

The present book is kept checked up and correction sheets issued from time to time as the changes occur. I will also say I have checked over this book for a Bemidji rate. This issue of rate books has been a losing proposition to the association so far as the sale of them is concerned.

So many books have been distributed free to the trade by the members, that the directors voted that hereafter, when a member had received the supply of books allotted to him, a charge to cover the cost be made for all books supplied. Our supply of reference books is getting low and possibly we should get a new supply bearing the date of the present meeting.

Members of our railroad committee have attended hearings held at Chicago and St. Paul by the Interstate Commerce Commission, to investigate methods of weighing cars now in force among the railroads. Hearings on this question are still being held by the commission but no rulings have been issued. The question of minimum weights on cedar posts and poles in central freight association territory was taken up with Eugene Morris, chairman, but so far we have not been able to get a reply other than the roads have the matter under consideration.

During the year meetings were held by the special insurance committee to consider the adoption of the inter-insurance plan, by pulpwood and tie committees to go over the tie and pulpwood situation.

Our association now consists of 32 members, five new members being admitted in 1912. They were: Curry & Whyte Co., Duluth, Minn.; I. Stephenson Co., Trustees, Wells, Mich.; Clark Pole & Tie Co., Behidji, Minn.,; Finch Bros., Superior, Wis., and the Learned Cedar Co., Minneapolis, Minn.

The membership committee has several other firms eligible to membership under consideration and hopes to be able to increase the membership as much more during the present year."

The election of officers resulted as follows: President, W. C. Moss, Minneapolis; vice-president, J. W. Benham, Chicago; treasurer (re-elected), W. B. Thomas, Manistique, Mich.; secretary (re-elected), H. H. McKinney, Minneapolis, H. M. Reade and E. L. Clarke were elected directors for two years.

Discrimination Charged in Pittsburgh.

The Pennsylvania Railway Commission may be asked to pass upon the complaints of telephone patrons in Pittsburgh, who declare the practice of the Bell company of making limited service contracts is in restraint of trade. Emmet C. Bates, contract manager, and W. B. Clarkson, division manager, of the Central District & Printing Telegraph Co., met the railroad and transportation committee of the Chamber of Commerce several days ago, and later the Pittsburgh Industrial Commission, to discuss the situation. Both meetings were secret. These two organizations had received complaints and are trying to secure reductions in the present local telephone rates, many members favoring the elimination of the unlimited service contracts if a reasonable charge is made for limited service. The telephone officials say that the number of unlimited service contracts in use is not over 15 per cent. They also say that Pittsburgh is receiving as low general rates as any other city.

Practical Telephony for the Practical Exchange Manager

A Series of Articles Relating to the Construction, Maintenance and Operation of a Moderate Size Telephone Exchange, Which Began in the Issue of September 21, Expressed in Everyday Terms, Easily Understood—Principles Easily Applied

By H. R. Van Deventer

Perhaps some reader has a voltmeter and does not know its resistance. Usually it is stamped on the case, and if not, the maker will supply it upon request. It can easily be determined where a resistance box or "bridge" is at hand. Connect the meter and battery in series. Note the reading, say 12 volts. Now place the bridge in series with the battery and meter and unplug enough resistance to make the reading exactly one-half the first, i. e. 6 volts. The amount unplugged, or resistance taken out of the circuit, will be the meter resistance.

With a voltmeter of known resistance, to measure an unknown resistance the procedure would be as follows:

A. Measure the voltage of the battery by connecting it directly to the meter.

B. With the unknown resistance in circuit, note the number of scale divisions over which the pointer moves. This will equal the number of milliamperes flowing. In the case of the specially adjusted instruments mentioned, each scale division is equal to 0.0002 ampere.

C. Divide the reading *A* by *B* expressed in amperes and subtract the resistance of the voltmeter.

Suppose the battery voltage reading is 3 and the factor *B*, 40 scale divisions or .008 amperes. Then the resistance would be 3 divided by .008 or 375. Subtract the meter resistance, 250 ohms, and the remainder, 125, is the ohmic resistance of the coil or line under test.

When measuring coils, such as generator armatures, ringer and drop spools, etc., it is better to measure one coil against another, rather than being governed by the markings. For instance, an 800-ohm ringer coil (one-half a "1600-ohm" ringer) may measure only 750 or as much as 900. This will not prevent it giving perfect satisfaction, provided the variation is not due to something which has changed the resistance from what it was originally. Coils that are wound in December will measure differently in July; passing a heavy current through a coil, will make it measure more than when cold; a line measures more on a hot day than on a cold one. Hence some judgment must be exercised when making measurements of resistance under varying conditions of temperature. .

It is possible to rely absolutely on the indications of the instruments at any time. The average normal characteristics of the coils or lines should be observed. When a test is made and an abnormal reading obtained, the cause of such a reading should be written down, with a brief memorandum of the "action" of the voltmeter.

This action is as plain as print to the man who understands. An instance of this is that of an old wire chief whose interpretations of the meter's action were almost uncanny. He would order up a line upon which some vague trouble had been reported and, upon testing, would find nothing. Would he order this line "down" as many a less experienced and more impatient man has done? Not he! But with one eye on the meter and the other on the door of the manager's office, he would indulge in a surreptitious smoke and await developments.

Soon, perhaps in 10 minutes or maybe a half hour, there would be a sudden "kick" of the needle; a quick jerk like a fishing bob when the fish nibbles; a quick rise to the full voltage of the battery; a hesitating waver; and then a clear line again, which all tests thereafter would show entirely O. K. After a performance of this kind, the wire chief would say to his troubleman, "John, go out on the avenue and pull the slack out of the coppers on 186."

Sure enough, when John would go over the line, he would find the bare copper spans so slack that sometimes when the wind blew just right, they would swing together. This would cause a momentary "short" which not only flashed the line lamp on a common battery system but also tinkled the subscriber's bell and causes him to complain of "lost" and "false" calls, etc. To be able to make tests of this character, the wire chief must be familiar with his lines. When he sends a test current out over the line, he should be able with his mind's eye to follow it through cable and pole line, junction box and drop wires, from the underground to the protector, and see where the short, open or ground could occur.

From the wire tables, one is led to believe that a mile of No. 14 B. B. wire has a resistance of about 58 ohms. The writer has, however, never met this welcome figure in any "mile" of actual line. It is always a little more or less. He who can exercise his judgment so as to reconcile laboratory figures with the facts of actual construction, will find no difficulty in the useful application of these methods to his work.

The resistance per mile of line wire, both copper and iron, may be obtained from any standard handbook, or from the manufacturer of the wire. Wire of various manufacturers differs. The resistance of No. 14 wire of one kind is not always of the same weight per mile as another kind, and in calculating distances based on resistance per mile, the figures used should apply to the particular kind of wire used.

While data as to resistance and other characteristics of line wire is easily found, data regarding cable is not and perhaps, outside that possessed by the cable makers and the engineering departments of a few large operating companies, no accurate records exist. Ordinary copper wire resistance tables giving feet per ohm are of little value, as the "twist" of the individual pairs and of the pairs on themselves alters the resistance length. The following data is taken from the records of a large manufacturer of cable and will be found reliable.

Cable Data.

Cable may be divided into three general types—aerial, underground and submarine. A sheath of lead and tin is recommended for aerial lines, lead and antimony for underground. Submarine cable has an armor of galvanized iron wire, or, where it is not liable to disturbance or ground swell, a double thick lead sheath only is used.

The physical construction of the cable is standard and the ordinary purchaser could not obtain a deviation therefrom, except at great delay and expense. The gages of wire available are those which long experience has shown to be the best adapted for average conditions. This also applies to the composition of the sheath. It is advisable for a small company having both aerial and underground to use a sheath suitable for aerial use, so that in case of emergency, cable originally intended to go underground could go overhead.

The transmission efficiency upon which cables are com-

pared with one another and with open wire lines is a theoretical or so-called "artificial" cable, arranged in portable box form something like a testing set. This usually contains 36 to 40 "miles" of "cable," having a resistance per mile loop of 88 ohms and a mutual capacity of .060 m.f. with no induction. This resistance and capacity is considered equivalent to one mile of 19 B. & S. gage cable, and 30 miles of this is supposed to be the limit for commercial transmission.

These test sets should form part of the testing equipment of every engineer who is called upon to test any great amount of cable for transmission. In many instances a piece of cable itself may be used for test purposes, where both ends are available, such as when on a reel in stock. Simply loop the pairs through the cable in series, until the desired length is obtained. It is true that by this arrangement, the capacity and mutual induction values are changed somewhat from those prevailing in actual practice, but for comparative purposes, good enough results will be obtained. *(To be continued.)*

The Status of the Telephone at the Close of the Year 1912

The Utilization of Pupin Loading Coils on Long Distance Lines and Inter-Office Trunk Lines—Advances in the Economics of Wire Uses—Developments in Semi-Automatic Equipment—Automatic Telephony—Reprinted from the Electrical World

By Samuel G. McMeen

The year 1912 produced no epoch-making invention in telephony, but more than any previous one in telephone history it was marked by attention to refinement of details. The early years of telephone development were filled with activity, and the motto was: "Results first, refinement of method afterward." The struggle to meet the demand for quantity of telephone equipment lasted during nearly the entire life of the original Bell patent. Only by the beginning of 1912 had a reasonably satisfactory degree of saturation been reached and attention been directed in a large way to the more promising reductions of wastes and losses and the increasing of important efficiencies.

Utilization of Pupin Coils.

One of these endeavors, which was operative in Europe as well as in the United States, was the further loading of long-distance lines, and of inter-office trunk lines. The year 1912 closed with a gratifying history in this phase of the art. In the United States loading was continued as previously done, by the use of Pupin coils; that is, by using "lumped" inductance, instead of distributed inductance as employed in cables. In Europe, both methods continued in use with a growth in favor of the Pupin method over others. The year closes with a gratifying increase in practical knowledge of loading, on the part of telephone engineers and managers, and with a singular and interesting lack of knowledge on the part of the telephone-using public. Perhaps this is due to the fact, stated by Dr. Pupin himself, that "It is not a subject which lends itself to popular discussion."

The loading of the largest copper wires commonly used in the United States (435 lb. per mile of wire) tends principally to increase the radius of communication. Loading of circuits other than those requiring the largest wires may reduce the total cost of a line for a given grade of transmission over a given distance. The happiest way, however, of reducing the cost of a line, is to reduce the actual amount of metal in it and this, in telephony, is done by the use of phantom circuits. Out of the manifold difficulties of phantom operation has come finally the ability to phantom loaded circuits and to load phantom circuits. To have even one phantom circuit between two points requires the existence of at least two physical circuits. The more physical circuits there are, the more direct phantom circuits may be made from them, and there are no ultimate reasons why phantoms cannot be built upon phantoms indefinitely. Theoretical development of phantom circuits has covered a long period; practical development and wide use of these developments mark 1912 as their banner year.

Economics of Wire Uses.

There are other economic wastes of wire facilities than those which are lessened by the uses of loading and phantom principles. Telephone companies have applied composite and simplex methods to long distance lines for years but have suffered from the lack of a broad market for the telegraphic facilities so produced. On the other hand, telegraph systems have had within themselves the opportunity for similar economic gains because, fundamentally, two simple telegraph circuits are wasting one telephonic possibility. The coalition of commercial relations of the Western Union Telegraph Co. and the American Telephone & Telegraph Co. removed a difficulty in this regard. The best interests of the community require the best use of all property belonging to any part of the community.

The years succeeding 1912 will mark further economies in the harmonious operations of the telegraph and telephone facilities in the United States. Such possible expansion was not great in 1912, but the year was notable in its preparatory work. Progress along these lines in Europe was less marked than here, for obvious reasons of governmental inertia. A fourth advance in the economics of wire uses was in the further spread of train dispatching by telephone. As the year closes it may be said that arguments against the handling of trains by telephone have ceased. Other industries than transportation have seen the advantage of the method, and today electric lighting and power systems dispatch their loads over lines and apparatus similar to those designed for train dispatching. Telephony has yet to cover that field thoroughly but a satisfactory start was made during the year.

Common Battery System.

The common battery multiple switchboard remained the standard manual equipment for large central offices. Substantial progress was made, however, in the development of semi-automatic equipment, designed to reduce the amount of incoming-trunk switchboard apparatus and the amount of labor required to operate it. In this regard the year may be taken as the last one of preparatory development and 1913 may be expected to include the installation of many important examples of this system. Its purpose is to eliminate a number of acts heretofore requiring to be done by hand and the substitution for them

of the same or other acts performed by mechanisms, these, however, being wholly directed and partly controlled by the intelligence of an operator who retains communication with the calling subscriber.

Development in these semi-automatic systems has been dominated by several distinct interests in the United States and is more recently attracting the attention of competent minds abroad. Several of the fundamentals of this practice were reduced to finality during 1912. The way thus is paved for substantial progress hereafter. Semi-automatic systems of the type just mentioned address themselves directly to the elimination of manual incoming-trunk apparatus and manual labor upon it. In a large city trunking 90 per cent. or more of all originating calls, such machine equipment is likely to be exceedingly important.

In the great number of exchanges both here and abroad there is no inter-office trunking at all. In them, if operating labor is to be eliminated in any very great degree, automatic or semi-automatic systems must do all or some of the work of manual operators. The auto-manual system has had a wider trial during 1912 and has made useful history in the art of doing mostly by machinery what is done on a multiple board by hand.

Automatic Telephony.

Automatic switching systems, wherein the subscriber directs and partly controls the switching mechanism and in which no operator other than the subscriber has part, reached a new relation to the using public during 1912. Heretofore the widest use of and interest in automatic switching equipments have been in the United States. The installation of new systems in this country has been less than in other years. The growth in systems already installed went on at a satisfactory rate. No previous year covered more important refinements of detail of automatic apparatus than did 1912, and consider the development of devices for both semi-automatic and automatic systems as a single kind of endeavor, 1912 exceeded all previous ones in total accomplishment. In Europe, furthermore, the automatic idea attracted more attention, received more thought and progressed further toward wide use in 1912 than in any previous year.

Certain conditions attending governmental operation of telephone systems make the elimination of operators much more important there than here, and in some quarters it is felt that since automatic telephony is now where manual telephony was many years ago, it may reasonably be expected to accomplish the same degree of advance as, for instance, the manual switchboard experienced during the years from 1896 to 1902.

Competition continues to exist in the sale of telephone service; in many cities there still are two telephone systems; in all cities which have or have had two telephone systems the good and bad results of such competition still are in evidence; in some cities where there have been two telephone systems and now there is but one there are murmurings against monopoly, as seems inevitable in all such cases. Happily, there is evident a growing appreciation by the public of the exceeding value of telephone service and of its importance to the general community. This, it is hoped, may simplify the maintenance of satisfactory relations between the server and the served.

The Telephone Inspector and the Troubleman

Continuation of a Series of Articles Begun in the September 7 Issue of Telephony—They Deal in an Elementary and Explicit Manner With Many of the Problems Encountered by Telephone Men in the Operation of Small Exchanges

By A. E. Dobbs

Will Learns a New Trick of the Trade.

"Mr. Wilson," said Will upon his return, "the inspector in the other exchange told me that they used induction coils wound to only 20 ohms in the secondary, for long distance work, and that the coil on their long distance board only measured 7 ohms. Now, for our lines we use coils wound much higher than that. Why is it?"

"Let me tell you something," responded George. "I have known some experienced telephone men who couldn't figure that out, and you want to pay attention so you'll remember it. Give me a pencil. Here we have a long line (Fig. 38); so long, in fact, that we have 4,000 ohms of line resistance to contend with. Across that line in multiple we have ten 1,600-ohm bells, giving us a divided circuit distributed the whole length of this 4,000-ohm line. If one bell has 1,600 ohms resistance, ten bells jointly would have only one-tenth as much. You can understand that, can't you? You see it is just this way: If one bell offers 1,600 ohms obstruction to the current, two bells would offer only half as much. See? Three bells, one-third as much, and so on. Therefore, ten 1,600-ohm bells would have a joint resistance of only 160 ohms, which would all but short-circuit a line of this length."

"Hold on!" exclaimed Will. "You told me once that voice currents would not pass through those ringer coils."

"Yes, so I did, but some of it escapes through, a very small amount, say two per cent.; but even this small amount———"

"Wait a minute!" almost shouted Will. "Don't come so fast. You say that 1,600 ohm coil only takes two per cent. of the voice current. Now hold on. Two per cent. is equal to one-fiftieth of the whole, so that the resistance of that coil

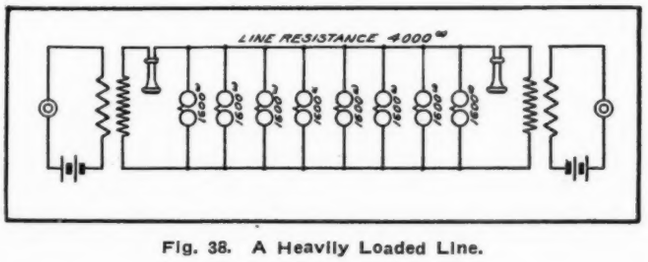


Fig. 38. A Heavily Loaded Line.

would be the same as 80,000 ohms. Is that what self-induction does? Is that right?"

George looked at Will in surprise, then gravely rubbed his hand over the auburn scalp and patted him on the back.

"You're all right. Now don't get excited, but keep calm. That was a very brilliant idea of yours, but don't get rattled, for I really feared the mental effort would cause you to collapse. How did you ever come to think of that?"

"Naw, come off," said Will; "but isn't that right?"

"Yes," replied George, slowly; "that is about right; but even this small amount with two people talking, still leaves

eight bells in circuit (Fig. 38), which, at two per cent. each, means 16 per cent. of the current lost from this cause alone. In addition to this, you have 4,000 ohms of line resistance, together with its static capacity, to overcome, so that with a 500-ohm coil at each end the talk would be rather weak. If, however, you have a low-wound induction coil, all the current left after this long journey would go into the receiver if the coil and receiver are in series. The resistance of the coil and receiver together would only be 80 to 90 ohms, and in this way the current would be diverted to the place where it is intended it should go.

"There is only one trouble with this plan, which is if some one leaves his receiver off the hook, it practically short circuits the line, so that no one else can be rung up till the receiver is replaced.

"One method of overcoming this difficulty is to insert a low capacity condenser in series with the receiver, so that others on the line can be called. The low frequency currents from the ringing generator will not pass through the condenser while the high frequency talking currents will."

"How, with only a 7-or a 20-ohm coil, do they raise the electromotive force of the line high enough to overcome all the line resistance?" questioned Will.

"Just this," answered George. "The voltage of the line does not depend so much upon the resistance of the coil as upon the number of turns, the static effect of the primary upon the secondary winding, size of the cord, etc. Besides this, they use a larger amount of battery than is usual with ordinary instruments, in order to obtain a larger *quantity* of current, and further, use copper wire with a very low resistance, so that a line 1,000 miles long will only measure a trifle over 4,000 ohms. If there are only two instruments on this line, a 500-ohm coil would be all right, although the length of the line and other things would determine this. One of the most powerful coils I ever tried was wound to only 75 ohms. That coil, however, required more battery than a higher wound coil. Now that is all I can explain to you at present, for, as I told you once before, the coil has to be proportional to the transmitter."

WILL TRIES AN EXPERIMENT.

That afternoon Will came in to the back room with an induction coil in his hand.

"Here is a coil I can't do anything with," he remarked, "and I think it must be open. I took it out and went after three or four more troubles and got them all right. Now I want a new one to put back where I got this."

"Well, we don't happen to have any more induction coils on hand just now," George replied. "Couldn't you fix this? Besides, why did you leave a subscriber's line open while you were chasing other trouble?"

"I didn't leave it open," responded Will, "for I connected the battery and transmitter to the secondary binding posts, and it talked good enough to last until I could get back."

"You did!" ejaculated George.

"Yes. Isn't it all right when I couldn't do any better?"

"Who ever put that idea into your strawberry head? Well, I must say," George went on, "you are a very smart boy. I have known men to hunt trouble for ten years and never think of that. Well, it's all right.

"Here is the trouble in this coil," for George had taken the cover off the induction coil and found the wire broken in the top layer. Removing the useless end, he unwound a couple of turns so as to get enough wire to bring out for a connection. Then he tested the coil and found it O. K., after which he replaced the cover.

"Now take the coil back," he instructed Will, "and get it in the set as soon as possible."

"That is a new one," remarked Johnson after Will had gone. "Did you ever think of anything like that?"

"No," replied George, "and you know it always takes some fool kid to think of a thing like that. Do you know what a helper of mine did in Warren in the days when wet cells were used? The battery zinc was broken so that he could not connect it in. The kid actually got a piece of No. 14 galvanized steel wire and used it in place of the zinc. He never went near the battery for three days, and nobody found out the difference until he brought the piece of wire back and told me what he had done. Of course, the zinc coating was pretty well eaten off, but there was still enough left to have worked the battery a day or two longer."

"Well," continued George, "this kid here will either make a smart telephone man or turn up in the penitentiary. I don't know which. I never have to tell him anything but once. But like all boys, he is careless, and I have to keep an eye on him more or less; but then, boys are not perfect. I have to keep him in check, of course, or he would take charge of this office and order me around, but for all that I'll put him against any boy in this part of the state."

"Look out that he don't learn too fast, and try to get your place," joked Johnson laughingly.

"I think I am old enough to take care of that," returned George.

(*To be continued.*)

Speak Gently to the Telephone.

It is one of the commonest as well as one of the most amusing of human idiosyncrasies to imagine that the louder one shouts into the transmitter of a telephone the more perfectly and comfortably does the sound reach the person at the other end, says The Christian Science Monitor. Great numbers of people, who in the ordinary affairs of life are tranquil and soft-toned, will habitually yell into a telephone receiver as if they were rooting for the home team. These are, perhaps, the same people who think that he who has not the remotest knowledge of English can grasp it without difficulty if only it is shouted at him loudly enough.

If a person does not understand English, no amount of shouting will make him understand it. If he understands a little English, he can best make out what another is saying to him when the other is calm. If he understands English very well, he will appreciate whatever is said to him all the more if it is not said in the key at which one usually hails a boat 300 yards offshore on a windy day.

It is the same way with the telephone. If it is entirely out of order, there is no more sense in yelling at the top of one's voice into the receiver than there would be in hallooing at the moon. If it is not working well, this can be best overcome by patience, strongly reinforced with clear enunciation. If it is working properly, the person at the other end can hear most distinctly when the tone employed is that used in ordinary conversation among decent people.

Big Chicago Independent Installation.

Sears, Roebuck & Co., the big mail order house, of Chicago, has had for years an automatic inter-connecting system in its enormous factory in that city. Recently it contracted with the Illinois Telephone & Telegraph Co., operating the Independent telephone system there, for trunk line service, giving both city and long distance connection. Some 450 telephones in the Sears, Roebuck plant now have both inside and outside service, 50 more telephones having been added.

Voluntarily Reduces Rates.

The Union Telephone Co. of New Castle, Pa., has announced a substantial reduction in rates and it is confidently expected that a large increase in subscribers will be secured.

Railway Telephony—Practical Points in All Branches

A Regular Department Which Appears Bi-Monthly—Scope Includes Principles of Construction, Testing, Operation and Maintenance—Columns Open for Contributions on Matters of General Interest to Those Engaged in This Branch of Telephony

The Use of a Milliammeter for Testing.

By John A. Kick.

The usual method in testing for telegraph line trouble is to place a 250-ohm or 300-ohm relay in the affected circuit and observe the action of the relay while the circuit is being opened or grounded at the test stations. This method of testing for a case of trouble on a line

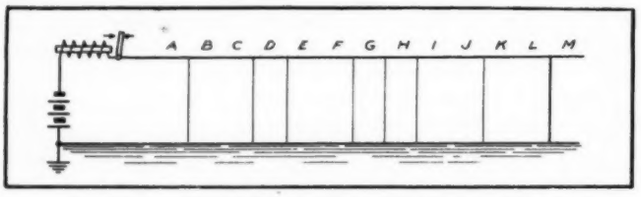


Fig. 1. Line with Ground and Minor Leaks.

which is practically insulation perfect requires very little skill, as the action of the relay is decided.

During rains and at other times when the insulation is low, a wire chief is required to use keen judgment in making deductions based on the action of the relay.

As an example of such a condition, which is sometimes encountered, and the margin upon which the wire chief is required to make a decision, attention is directed to Figs. 1 and 2, which represent a telegraph circuit with poor insulation conditions as well as a ground trouble.

In Fig. 1 the line is shown with a ground trouble near *L* and a large number of minor leaks (partial grounds) between *A* and *L*. The line current condition is shown graphically in Fig. 2, and indicates the margin of current for operating the relay.

The opening of the line at *M*, would only change the current slightly. The wire chief will be required to find this slight change by carefully adjusting the relay up until the retractile spring barely operates to pull the armature away from the front stop. The wire is then closed at *M* and the relay is observed to close to the front stop if the increase of current is sufficient.

The special high wound relay has been used for testing line troubles ever since there has been a wire chief's position. Some wire chiefs are so skillful from long practice that they make astonishingly few errors. Although the relay test is an old friend, it is by no means the reliable method which is at hand at almost all wire chiefs' stations. "Seeing is believing" and the nearer the approach to a real photograph of the nature and location of line troubles the nearer the ideal method.

A medium for conveying to the wire chief a near photograph of the nature and location of wire trouble is the milliammeter. By its aid a wire chief will secure results not possible by the relay method. Placing a milliammeter in the line circuit at station *A*, at once a current reading in milliamperes is noted when the circuit is closed. Unless the circuit is to a dead ground at some point between the terminal and the testing point, the wire chief can actually see, by the action of the needle, the result of an open or ground test at any station on the circuit.

As an illustration, in Fig. 3 it is assumed line *A* to *L*, has a resistance of 15 ohms per mile with 12 stations five miles apart, and having 150 ohm relays. Also that a normal working current of 70 milliamperes is produced by an equal voltage at each terminal. That is, a voltage at each end which will produce the normal working current to a ground at the ohmic half-way point on the line or will produce half or 35 milliamperes to a ground at the distant terminal.

Next assume that an operator reports losing or being unable to raise some one or more offices on the circuit. The wire chief going in on the circuit with the milliammeter, notes normal reading to the battery and zero to ground. The indications thereby are that the line is grounded at its ohmic center. The next test will be made with stations near that position on the circuit.

Assuming that the wire chief noted 45 milliamperes to battery and zero to ground, he will know that the line is grounded approximately midway (in ohms) between the ohmic center of the line and the distant terminal. Also a current reading of approximately 140 milliamperes would indicate a ground at about the midway point between station *A* and the ohmic center of the line.

It will be noted (Fig. 3) that the nearer the trouble to the home office, the more conclusive the indications as the current rises in increasing steps to the successive stations approaching the testing station.

Testing for an open by having the stations ground the wire, can be illustrated by Fig. 2, which represents a line heavy with escape. To a ground beyond the trouble no current change will take place, but to a ground between the wire chief and the open a current change would take place, the needle of the milliammeter advancing to indicate the current to a ground.

Supposing the line leak to be as represented in Fig. 2,

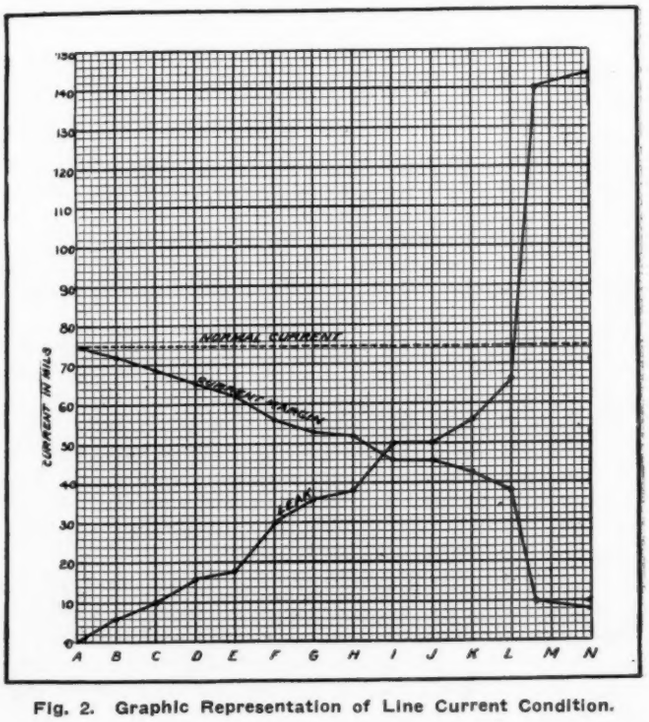


Fig. 2. Graphic Representation of Line Current Condition.

a condition obtains wherein the relay test would prove misleading, as the line open at *N*, with a ground leak between *A* and *M*, giving a current only one or two milliamperes less than a ground at *N*, the current change

could not be detected in the relay adjustment. The milliammeter reading would show the current change and demonstrate that the wire was open beyond *M* and in addition would reveal the insulation fault between *A* and *M*.

In testing for a cross, a relay is placed in circuit with either wire 1 or 2 (Fig. 4). The several test stations are asked to open that wire until the trouble is located as between two stations, by observing that at one station the relay falls back and to the next it does not.

In using a milliammeter there is no possibility of a false test by reason of a current leak, as the observer can see an indication of current change, however slight, to each test which would in any wise change the multiple circuit effect produced by a cross. By the constant use of a milliammeter, a wire chief becomes acquainted with each wire, that is, the normal current on each wire, the current from the distant terminal, the locality of foreign influences, cross leaks, leaks to ground, current readings to ground at test stations, and other characteristics.

Where gravity battery is maintained at the distant terminal, the wire chief can keep a daily check on the current output and advise maintainers when the battery needs attention.

Assuming a wire chief making morning test on all wires, starts from one end of his board and successively places his milliammeter in the line circuits, noting the current readings with battery regular, then to his ground from the distant terminal battery. If both are normal, the circuit will be found all right. But if the first reading shows normal current and the second zero, the line is grounded at the non-voltage point.

Where two unequal batteries are supplied, that is, say 180 volts at one terminal and 100 volts at the other, then the no-voltage or normal current to ground position will shift from the ohmic center of the line toward the lesser voltage. Should the meter show less than normal and zero to battery and ground respectively, the circuit is grounded beyond the no-voltage point, the probable location being indicated by the current reading.

The no-voltage point on the line is the point where a ground will show normal current to both terminal batteries. That is, a 5,000-ohm line with 150 volts at one terminal and 100 volts at the other would show normal current with a ground at 3,000 ohms from the 150-volt battery and 2,000 ohms from the 100-volt battery.

The milliammeter is used to good advantage in quadruplex

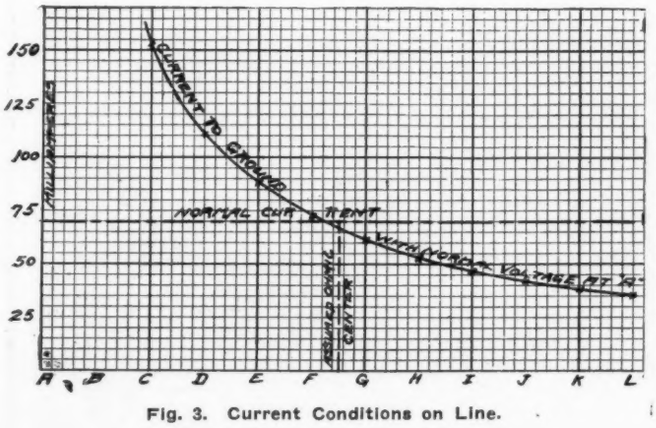


Fig. 3. Current Conditions on Line.

and duplex work in adjusting the current conditions in the line and local. By placing the distant quadruplex set to a ground and the home milliammeter under the quadruplex wedge, a reading of both long and short ends can be made. With the home set to ground the distant set can be tested to ascertain the effective output.

Complaints are made of "light to one pole" and by the use of the milliammeter the cause can often be located. After wiring up an office equipment a milliammeter test for the current conditions in the various circuits will frequently develop the fact that irregular conditions exist and by this knowledge the fault is cleared.

There is a certain amount of care necessary in handling

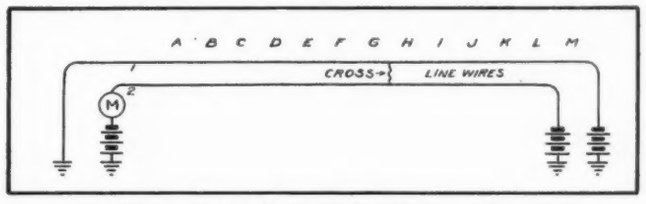


Fig. 4. Circuit for Testing for a Cross.

a milliammeter as it is a delicate instrument and can be burned out or the indicator badly bent by its being placed in a circuit carrying current considerably in excess of the capacity of the instrument. However, few delicate testing instruments are injured by experienced wire chiefs. Their experience is the result of practice and during this practice period, some expense of repair may be incurred. This should be gracefully paid and charged to education. A short circular on "How to use" is worth a whole volume of "How not to use" and "Don't."

A line with 20 selectors operating on 6 milliamperes will requires 120 milliamperes of current from the main signal battery. By placing the milliammeter in one side of the circuit with the signal relays closed the current can be read. With a fixed current value of say 6 milliamperes for each station, and an output of the calculated total current, it is assumed that each bridge is actually receiving the 6 milliamperes, but a milliammeter test of the current in each selector under operation is interesting and inspectors could make an occasional test of each bridge with good results.

Large Output of Copper in 1912.

Statistics and estimates received by the United States Geological Survey from all plants known to produce blister copper from domestic ores and from all Lake mines indicate that the copper output of the United States in 1912 exceeds that of any previous year in the history of the industry. Not only is the total output the largest ever recorded, but six of the large copper-producing states—Arizona, Michigan, Utah, Nevada, New Mexico and Alaska—have each exceeded all former records of production, while Montana and Tennessee have nearly equaled their previous record productions.

The figures showing smelter production from domestic ores, which have been collected by B. S. Butler, of the Geological Survey, represent the actual production of most of the companies for eleven months and an estimate of the December output. The November figures for a few companies were not available, and these companies furnished estimates for the last two months of the year. According to the statistics and estimates received, the output of blister and Lake copper was 1,249,000,000 pounds in 1912, against 1,097,232,749 pounds in 1911.

At an average price of about 16 cents a pound the 1912 output has a value of nearly $200,000,000, against $137,154,092 for the 1911 output.

Preliminary statistics showing the output of refined copper are not collected by the Geological Survey. Figures published by the Copper Producers' Association show an output of 1,429,147,150 pounds for the first 11 months of 1912 and indicate that the production of marketable copper by the regular refining plants from all sources, domestic and foreign, will amount to about 1,560,000,000 pounds for 1912, against 1,433,875,026 pounds in 1911.

Only Place Alfalfa Finds Pity is in Dictionary

Words and Music by W. L. Capple

SAY RUBE, GIMME A LIFT. I WANT SOME ONE TO PULL UP THIS POT OF SOLDER WHEN THE BOSS YELLS DOWN FOR IT— ARE YOU ON?? —GET ME??
I BE ALWAYS WILLIN' TA HELP THE TELLYFONE BOYS, B'GOSH! Y'SEE MY NAME BE GRANGER— ALFALFA DRYCELL GRANGER
HEY YOU, DOWN THERE!!! SHOOT IT UP FASTER— I CAN'T USE ICE CREAM, Y'KNOW
B'LIEVE ME IT'S SOME SHAKEY CROSS ARM THE BOSS IS ON UP THERE — LOOKEE IT BEND — WOW!!
WOW!! I'M BURNT— CUT IT OUT!!!
!!!
CONFOUND YOU!!! D'YOU THINK I'M MADE OF ASBESTOS?? TRIED TO CREMATE ME, HUH?! LEGGO THAT! ROPE OR YOU'LL JERK THE BOSS DOWN NEXT!!
QUIT YANKING!! LEGGO, QUICK!!! HELP!!!
IT'S THE BOSS!
NAIL HIM BOSS— NAIL HIM!!
I JUST DID HIT HIM WHERE HIS BRAINS OUGHT TO BE
TELEPHONE Co COMPLAINT DEPT.

Proceedings Before Commissions, Courts and Councils

Discussions and Rulings of State Bodies Having Supervision of Telephone Companies, Decisions of Courts in Matters Affecting Public Relations of Utilities, and Actions of City Councils Bearing Upon Franchises, Rates and Service

Federal Investigation of the A. T. & T. Co.

"Attorney General Wickersham has recently informed a representative of the Electrical World," says that paper in its current issue, "that the government's investigation of the methods of the American Telephone & Telegraph Co. and its numerous subsidiaries is practically completed and that a decision has been reached as to whether a suit should or should not be instituted against the company. What decision he had reached he would not state, but indicated that when the new administration takes over the reins of authority in the Department of Justice it will find itself confronted with much new business. It is now frequently rumored in Washington that the Attorney General has finally decided to bring suit against the 'telephone trust,' alleging violation of the Sherman law.

"Mr. Wickersham has now before him a mass of data in relation to the case which has been accumulated by special agents of the Department of Justice following months of investigation which covered the whole country. These reports make a record almost as voluminous as that in the Standard Oil case. The chief point which is now said to be under consideration is that of determinmg whether or not the Bell interests have restrained trade in an illegal manner. This involves the whole matter of telephone and telegraph service throughout the country, and many interwoven questions of a complex character, such as whether the Western Union Telegraph Co. is using patents in restraint of trade. If the latter complaint reaches the courts, there is said to be involved a new interpretation of the patent law relating to a highly complicated situation.

"The business relations of the Bell company with the Western Union Telegraph Co. form one of the subjects into which the reports of the special agents are known to have gone in detail, including the practice of connecting with the Western Union Telegraph Co. any person calling by telephone and desiring to send a 'telegram.' Alleged difficulty on the part of telephone subscribers and the public generally in securing connection with the offices of the Postal Telegraph Co. is another matter under investigation. The reports deal, furthermore, with the alleged attempts of the Bell interests to secure a monopoly of the telephone field through buying out Independent telephone companies throughout the whole country, but particularly in the Middle West, where the Independent companies flourished in great number some years ago but are now disappearing."

Readers of TELEPHONY will smile at the concluding sentence of the World's article, concerning the "disappearing" of Independent companies in the Middle West, and naturally argue that, if the other statements are no more accurate than the last, none is worthy of much credence. Even the Bell officials themselves, we think will admit that they have not noticed much lack of competition in the Middle West. TELEPHONY reprints the above article from the Electrical World simply for the information of its readers.

Cut Chicago Bell Profits $700,000.

The $700,000 reduction of the profit to be allowed the Chicago Telephone Company, recommended in the report of Professor Edward W. Bemis, the city's expert, was adopted this week by the council committee on gas, oil and electric light as the basis for the making of new reduced telephone rates.

That amount will not be wholly applied to reduction of rates, as the committee also voted to take account in fixing the new charges the proposed pension fund for employes to be established by the company, and a proposed increase in their wages that the company agrees to make if allowed sufficient return on its investment.

The aldermen on the committee were not unanimous in adopting the report. Some of them thought the total reduction of rates ought to amount to more than $700,000.

One member made a stubborn fight to have included in the total reduction $250,000 of the Chicago company's share of long-distance tolls, not included in the Bemis valuation. Losing in this, he fought to have the pension and the wage increase left out of consideration. The report, however, was adopted 8 to 4.

Immediately after the committee convened the following resolution was adopted:

"Resolved, That the committee on gas, oil and electric light hereby adopts the report of Professor Edward W. Bemis of October 25, 1912, recommending among other things a reduction in telephone rates of $700,000.

Resolved further, That the amount of said reduction be applied among the following items: Employes' old age and disability insurance and sick benefits; increase of wages; reduction of rates, and that the respective amounts to be applied to each of the foregoing items shall be hereafter determined by the committee and fixed by a subsequent resolution."

Chesapeake & Potomac Wins Rate Action.

After hearing lengthy argument by counsel in the Circuit Court for Baltimore, for and against the granting of an injunction to prevent the Chesapeake & Potomac Telephone Co. from abolishing the old $78 flat-rate, grounded-circuit telephones, Judge Bond refused to grant the injunction. An appeal will be taken to the Court of Appeals.

W. Cabell Bruce, chief counsel for the Public Service Commission, and Charles Carter, counsel for the Chesapeake and Potomac Telephone Co., lined up together before Judge Bond to oppose George Stewart Brown, Charles J. Bonaparte, former attorney general of the United States; and others, who had asked the court for the injunction. Issue was joined over the question whether the Public Service Commission can supersede all legislative acts as to rates or whether it can only act in accordance with the statutes.

Mr. Brown declared that the entire public service commission law creating the Public Service Commission is plastered over with the condition that the rates fixed by the commission must be such as are allowed by law, and that the act creating the commission does not repeal and wipe out rates established by acts of the legislature such as the law authorizing the $78 flat-rate telephone service in 1892. He illustrated this fact by declaring that if statutes could be thus wiped out the law which created the five-cent carfare, nearly 60 years ago, would have been wiped out, in spite of the effort that has been successfully made all these years to preserve it.

The idea of the public service commission act was to have a commission to cheapen rates, not to raise them. If there had been any idea at the time that it was to raise rates, the commission act would never have passed the legislature.

The present injunction suit is not to be confused with the fight which is being made by the Telephone Protective Association to have the ordinary flat-rate telephones maintained and which is to be fought out before the Public Service Com-

mission again later. The individuals who are fighting for the $78 flat-rate claim that under the law this has never been repealed and that even if it were over ridden by the Public Service Commission they would still, by the provisions of that act, have a right to come in as ordinary flat-rate subscribers.

The fact that the chief counsel for the Public Service Commission was lined up with the telephone company in court against telephone subscribers caused some little comment.

Mr. Bruce, for the Public Service Commission, declared that those fighting for the maintenance of the $78 flat-rate telephones have no standing in court because the creation of the Public Service Commission wipes out the statute fixing that rate.

"This $78 rate is gone, absolutely gone," said Mr. Bruce. "These sections are repealed in toto. The people of this commonwealth made up their minds that the whole matter should be referred to a commission and there are no exceptions to the scope of its work. It was the intent of the act that the commission was to see to charges. The order passed by this commission that all flat rate telephones should go out on January 1, 1913, is final, but permission is given to reopen the matter before the commission before next April 1."

Urges Action in Baltimore Case.

Aroused by fear that the United Railways investigation in Baltimore may extend over a long period and sidetrack the telephone investigation, the Protective Telephone Association of Baltimore has sent to the Public Service Commission of Maryland a letter urging that the telephone hearing, for which the Association has been making preparation, be taken up at once and that the commission give the association the services of the people's counsel, as provided for in the amendment to the public service act.

The association had already asked for the aid of Albert C. Ritchie as soon as he was through with the gas and electric case, and now repeats that request for the services of the attorney who may be chosen as Mr. Ritchie's successor. The counsel and executive committee of the association, which has a membership of 500, insists that the telephone situation is in a far more critical stage than the railway case, and that the business community would much prefer to have the telephone rate question settled at once rather than await a settlement of the railway case, which, they say, is not urgent.

Civic Federation Annual Meeting.

The thirteenth annual meeting of the National Civic Federation is to be held at Hotel Astor, New York City, on January 28 and 29. Among the other large questions to be discussed is the work of the Federation along the lines of the regulation of public utilities and the framing of uniform legislation bearing on this subject.

The model state bill regulating public utilities has been drafted by a department, of which Emerson McMillin is chairman, and Dr. John H. Gray director of investigation, and which is composed of leading state railway and public utility commissioners, representatives of various public utility companies, and of political economists and technical experts who have been investigating the matter in this country and in Europe.

In the investigation made by the department the general question was, how far can public regulation go to be effective and not interfere unnecessarily with management? Especial study was made of the sliding scale principle employed by London in dealing with electric light and gas companies, and particular consideration was given to the question of state vs. municipal regulation of public utilities, as now in force in California.

The department on regulation of industrial corporations, under the chairmanship of Seth Low, has a committee at work drafting a model bill for uniform state legislation on the regulation of combinations and trusts. The same department is also preparing modifications to propose for the Sherman Anti-Trust Act.

January Term of Oklahoma Commission.

The Oklahoma Corporation Commission has set down for hearing at its regular term, which commences on January 14, the proposed order directed to all telephone and telegraph companies operating in Oklahoma, giving the patrons of those companies the right to name the route of the message. It is understood that the order will be vigorously opposed.

Another order of more than ordinary interest set for hearing on the same date is that which would require an accounting and a refund of alleged excess charges collected at Purcell, Okla., by the Purcell Telephone Co. It is alleged by the commission that the company increased its rates there without permission from the commission and it is now demanded that it refund to its patrons the amount of the increase.

The Inola Telephone Co. has made complaint to the commission against the Iron Mountain R. R. Co., asking that it be required to pay for the telephone installed in its depot by the company.

Authorizes Stock Dividend.

The Public Service Commission, of Ohio, has authorized the Convoy Home Telephone Co., of Convoy, Ohio, to issue $5,000 of stock for distribution among its stockholders to reimburse them for a like amount of money spent from earnings in the improvement and extension of the system.

Discussing the case the commission said, in part:

"It appearing that moneys in the sum of more than $5,000 have, by the company, been expended from its income for the acquisition of property and the extension and improvement of its service, and it appearing further that said moneys represented the surplus earnings from the operations of the company, properly accruing to the holders of its capital stock as a return upon their investment, which had been diverted from their proper channel of distribution as dividends to facilitate and expedite the development of said company, the commission is satisfied that the prayer of said petition should be granted."

The issue and distribution were accordingly ordered, report of the transaction to be made to the commission when accomplished.

Kansas Association Changes Offices.

The Kansas Independent Telephone Association has moved its headquarters in Topeka, Kans., to Room 15, Shawnee Building. All communications should hereafter be addressed to this office. The Shawnee Building is one block west of the National Hotel, at the corner of Seventh and Jackson streets, and one block north of the State House grounds. F. B. MacKinnon, secretary of the association, urges telephone men to make that their headquarters while in Topeka.

Finances of Manitoba System.

The latest report of the Manitoba government telephone system, which covered the first ten months of 1912, shows a total revenue of $1,212,461, as against an expenditure of $909,-181, leaving a balance of $302,280. The number of exchange stations in operation on November 1 was 24,038, rural stations

California Companies Interchange Service.

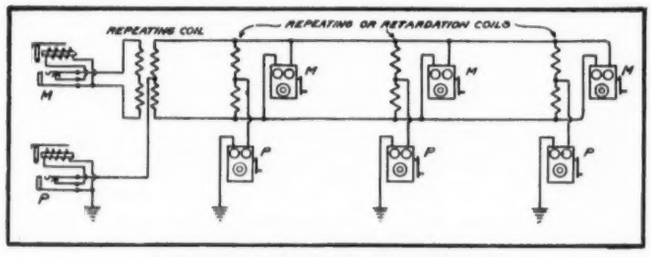
Without waiting for the actual consolidation of the two companies, which is to take place in May, the San Gabriel Valley Home Telephone Co., of Alhambra, Cal., and the Pacific Telephone and Telegraph Co., have installed an interchange service for the benefit of their subscribers.

Queries on Theory and Practice

There Will Be Cross Talk on Grounded Lines.

"Can a metallic line, 25 miles long, with 20 subscribers, be made into two grounded lines without cross talk interfering with conversations on this and other lines running parallel, it being transposed every half mile?"

No, if you convert this metallic circuit into two grounded circuits, you will have bad cross talk between the two and cross talk more or less severe between them and the other



A Ground Return Phantom Circuit.

lines, depending upon the distance which the other lines run parallel. If you really need to get another circuit without stringing more wire, you might leave ten stations on it metallic, and put the other ten on it as a grounded phantom.

The plan of the latter is shown in the diagram. *M* is the metallic circuit, with a good, well balanced ring through repeating coil, inserted at the central office. From the center of the line side of the coil, a line is carried to the drop and jack for the phantom. The metallic circuit telephones, *m m m*, are bridged as before. The phantom circuit telephones, *p p p*, are bridged from the center of impedance or retardation coils to ground. Some repeating coils can be wired up to serve, but the main requirements are that the two halves must balance and be low in resistance.

The metallic circuit will be as free from cross talk with the other circuits as before and the phantom and metallic will not cross talk as long as the lines are clear. But the phantom, being grounded, will act like any other grounded line and pick up cross talk and noise from any source of exposure. It might be well not to split the number of subscribers, but to put only enough on the phantom to relieve the congestion of the metallic circuit. Then a fewer number of subscribers will be bothered by cross talk.

Wireless Tone Test Difficult to Make.

"Can you inform me how to make a wireless tone test for locating trouble in cables, or tell me who manufactures them?"

You would have to do a lot of experimenting to make a good wireless cable tester. It is better to buy one from a maker. A successful outfit is produced by one of TELEPHONY'S advertisers.

A Variety of Questions.

"What is the resistance of the Atlantic cable? What is its capacity? How much current is required to operate a relay in Liverpool? Why is it not possible to hold a conversation by telephone to Liverpool as well as by telegraph? Is it practical to talk from New York to San Francisco? If not, why not? What is the greatest drawback in long-distance conversation by telephone?"

To ask for the resistance of the Atlantic cable is like asking for the height of a man. There are a number of Atlantic cables, and they differ very greatly in resistance. One of them, which is fairly representative, has a resistance of 2.93 ohms per nautical mile, is 2,384 nautical miles long and has about 6,985 ohms total resistance.

The capacity of the cable mentioned is about 0.43 microfarad per nautical mile, so that its total capacity would be about 1,035 microfarads.

We do not have at hand the information as to the amount of current required to operate the receiving apparatus.

It is not possible to hold telephone conversation through a transatlantic cable at the present time because of the great attenuation and distortion caused by the resistance and capacity. Attenuation signifies "weakening" and means that enough current would not pass through the cable so as to produce an audible sound. Distortion means that should anything be heard, it could not be understood, as the words would not be distinct.

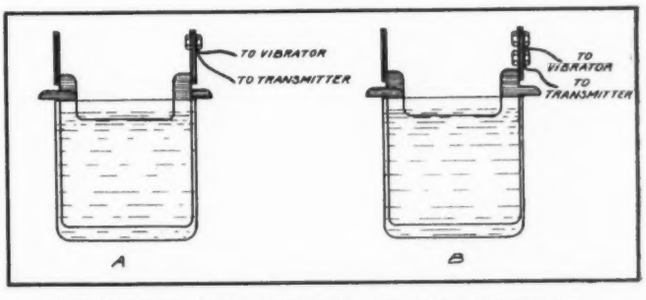
It is not yet practical to talk from New York to San Francisco. The resistance and capacity of the line are the principal reasons for failure.

The greatest drawback to long-distance conversation by telephone lies in our inability to deliver enough conversation current to the receiving telephone to be heard and to have the delivered current distinct and clear. We might possibly increase the received current by employing much more powerful transmitters and batteries. But the resistance and capacity of the line distort the waves so very much that the received conversation current is muffied and it is impossible to understand it. Distributed capacity is worse than capacity lumped all at one point. Read the writings of Prof. M. I. Pupim and others for a better understanding of this subject.

Proper Connection for Transmitter to Battery.

"I have an automatic transformer for my ringing power. It rings from a 11-cell storage battery of 24 volts. Is there any way that I can overcome the kick-back noise of the vibrator so as to get battery for the switchboard transmitter off of the same storage battery?"

You will have to run a separate pair of wires for the transmitter clear to the lead terminals of the battery. The



The Wrong and Right Methods of Battery Connections.

slightest extra resistance in that portion of the circuit common to both transmitter and vibrator, will make the noise of which you complain. Do not rely upon bolted connections unless the transmitter has its own separate bolted terminal. The illustration will make this plain. Even then, if the battery is too small, it may have sufficient internal resistance to cause the noise. Placing capacity of several microfarads across the transmitter leads, will often reduce the noise to a bearable point. But the most reliable is low resistance in the battery.

Fort Wayne Co. Increases Capital.

A certificate has been filed by the Home Telephone & Telegraph Co., of Fort Wayne, Ind., showing that it has increased its stock from $250,000 to $500,000.

Uniform Accounting System of Interstate Commission

Complete Details of Plan Promulgated by Government Body for Use of Every Telephone Company Having Annual Income of Upwards of $50,000—Plan for Smaller Concerns is Now Under Contemplation—System Effective Universally January 1, 1913

INSTRUCTIONS PERTAINING TO BALANCE SHEET.

3. **Balance-sheet accounts.**—By balance-sheet accounts are meant those titles under which the ledger accounts are combined and summarized to show the assets, liabilities, and profit or loss of the business at a given time. Where the title and definition of a balance-sheet account clearly indicate that it is a summary of other accounts, it is not required that a special ledger account shall be raised under such a title to include the balance from the accounts usually carried on the ledger.

Cost or book value of securities owned.—The term *cost or book value,* as applied to various accounts representing securities owned, is intended to recognize the option of the company of carrying its investments in securities either at cost or at a reasonable valuation other than cost. Whenever securities are acquired they are to be entered on the books at cost. If, subsequently, the company desires to adjust their value on account of substantial appreciation or depreciation, the entries in its books, with respect to such securities, as well as its annual reports to the commission, should clearly show the reasons for making the adjustments.

5. **Reacquired securities.**—The capital stock and funded debt liability accounts in the balance sheet are intended to include only the par value of such capital stock or funded debt securities as have been actually issued to bona-fide holders for value or such securities as have been issued by other companies and have been assumed by the accounting company and are actually outstanding at the date of the balance-sheet statement.

When capital stock or funded-debt securities have been actually issued to bona-fide holders for value (or after such issue by another company have been assumed by the accounting company), and after such issue (or assumption) have been reacquired by the company under circumstances which require that they shall not be treated as paid or retired, they may be charged at par value to the appropriate asset account, but on the balance-sheet statement they should be shown separately as a deduction from both the asset and liability accounts in order that the asset accounts for securities owned will include only securities of other companies and that the liabilities accounts for securities issued or assumed will include only those in the hands of the public.

If any such securities are reacquired for more or less than their par value, the difference between the par value and the cost of reacquirements, after adjusting any amounts carried in the discount-and-premium accounts or other accounts with respect to such securities, should be debited or credited to Corporate Surplus or Deficit account, unless reacquired for a sinking or other fund, which is required to be represented by a reserve, in which case the difference should be debited or credited to the appropriate reserve account.

6. **Discount and Premium on Capital Stock.**—Ledger accounts should be provided to cover the discounts and premiums on each class of capital stock issued or assumed by the company. By *discount* is meant the excess of the par value of stocks issued or assumed over the actual money value of the consideration received for such stock (except stock that has been sold and reacquired); by *premium* is meant the excess of the actual money value of the consideration received for stock issued or assumed over the par value of such stock (except stock that has been sold and reacquired). Entries in these accounts representing discounts should be carried therein until offset, (1) by premiums realized on subsequent sales of the same class of stock, (2) by assessments levied on the stockholders, (3) by appropriations of surplus for that purpose, or (4) by charges to Corporate Surplus or Deficit account upon reacquirement or retirement of the stock. Entries in these accounts representing premiums realized should be carried permanently, unless offset (1) by discounts suffered on sales of the same class of stock, or (2) by credits to Corporate Surplus or Deficit account upon reacquirement or retirement of the stock.

If the net of the balances in the discount-and-premium accounts for all classes of capital stock sold or exchanged is a debit balance, the amount should be included in the balance-sheet statement in account No. 134, "Unextinguished Discount on Capital Stock"; if a credit balance, the amount should be shown in account No. 152; "Premiums on Capital Stock."

In no case should discount on capital stock be charged to or included in any account as a part of the cost of acquiring any property, tangible or intangible, or as a part of the cost of operation.

7. **Discount, Expense and Premium on Funded Debt.**—Ledger accounts should be provided to cover the discount, expense and premiums on each class of funded debt issued or assumed by the company. By *discount* is meant the excess of the par value of funded-debt securities issued or assumed, and the accrued interest thereon, over the actual cash value of the consideration received for such securities (except securities that have been sold and reacquired); by *premium* is meant the excess of the actual cash value of the consideration received for funded-debt securities issued or assumed over the par value of such securities and the accrued interest thereon (except securities that have been sold and reacquired).

By *expense* is meant all expenses in connection with the issue and sale of evidences of debt, such as fees for drafting mortgages and trust deeds, fees and taxes for recording mortgages and trust deeds, cost of engraving and printing bonds, certificates of indebtedness, and other commercial paper having a life of more than one year; fees paid trustees provided for in mortgages and trust deeds; fees and commissions paid underwriters and brokers for marketing such evidences of debt and other like expense.

If the net balance in any of these accounts is a debit, there should be charged to income account No. 338, "Amortization of Debt Discount and Expense," during each fiscal period (and credited to the discount and premium accounts in which the discount and expense is carried), such proportion of the discount and expense on the outstanding funded debt obligations as may be applicable to that period. This proportion should be determined according to a rule, the uniform application of which throughout the interval between the date of sale and the date of maturity, will extinguish the discount and expense on the funded debt. The charge to Income for any period shall not exceed the proportion applicable to that period, and a charge should be made for each period so long as any portion of the discount and expense remains unextinguished. In order that the discount and expense may be extinguished sooner, the company may, at its option, charge to Corporate Surplus or Deficit account all or any portion of the discount

and expense on funded debt remaining at any time unextinguished.

If the net balance in any of these accounts is a credit there should be credited to income account No. 339, "Release of Premiums on Debt—Cr.," during each fiscal period (and debited to the discount and premium accounts in which the premium is carried) such proportion of the premium on outstanding funded debt obligations as may be applicable to that period. This proportion should be determined according to a rule, the uniform application of which throughout the interval between the date of sale and the date of maturity of the debt, will extinguish the premium at which such debt was sold.

If the net of the balances in the discount and premium accounts for all classes of funded debt sold or exchanged is a debit balance, the amount should be included in account No. 135, "Unamortized Debt Discount and Expense;" if a credit balance, the amount should be included in account No. 168, "Unextinguished Premium on Debt."

Except as provided in section 11, page 33, no discount and expense on funded debt should be charged to or included in any account as a part of the cost of acquiring any property, tangible or intangible, or as a part of the cost of operation.

8. **Contingent assets and liabilities.**—Contingent assets and liabilities should not be included in the body of the balance-sheet statement, but should be shown in detail in a supplementary statement accompanying the balance-sheet statement. Contingent assets represent possible sources of value contingent upon the fulfillment of conditions regarded as uncertain. Contingent liabilities include items which may, under certain conditions, become obligations of the company, but are neither direct nor assumed obligations on the date of the balance sheet.

Text Explanatory of Balance-Sheet Accounts.

ASSET ACCOUNTS.

PERMANENT AND LONG TERM INVESTMENTS.

100. Fixed Capital Installed Prior to January 1, 1913.—In this account (on the balance-sheet statement) should be shown the total of the balances in the ledger accounts representing the company's fixed capital, which was installed prior to January 1, 1913, and which is still in service at the date of the balance sheet. (See text of this account later.)

101. Fixed Capital Installed Since December 31, 1912.[1]—In this account (on the balance-sheet statement) should be shown the total of the balances in the ledger accounts representing the company's fixed capital which has been installed since December 31, 1912, and which is still in service at the date of the balance sheet. (See text of this account later.)

102. Reserve for Accrued Depreciation.—Cr.[1] Credit to this account such amounts as are concurrently charged to account No. 608, "Depreciation of Plant and Equipment," No. 701, "Shop Expense," No. 702, "Stable and Garage Expense," and No. 703, "Tool Expense," to cover the expense of depreciation of plant, equipment, furniture, tools and implements, as specified in the text of these accounts. This account should also be credited with any amount carried in reserve on January 1, 1913, to cover the expense of depreciation on plant, equipment, furniture, tools and implements installed prior to that date.

Charge to this account the realized depreciation of tangible fixed capital installed since December 31, 1912, when such capital is relinquished, retired, or destroyed, also the amount of depreciation carried herein in respect to tangible fixed capital installed prior to January 1, 1913, when relinquished, retired, or destroyed. (See secs. 14 and 23.)

Charge also to this account such part of the expenditures for extraordinary repairs as is concurrently credited to account No. 611, "Repairs Charged to Deserves—Cr."

103. Reserve for Amortization of Intangible Capital—Cr.[2]—Credit to this account such amounts as are concurrently charged to account No. 340, "Amortization of Landed Capital," and to account No. 674, "Amortization of Franchises and Patents." Charge to this account when any franchise, patent, or landed capital expires or is relinquished, the amount at which it stood charged in the company's fixed capital accounts or such portion thereof as has been previously credited to this reserve. When any intangible capital acquired prior to the raising of this reserve expires or is relinquished, that portion of its cost which has not been covered by credits to this account or previously written off should be charged to account No. 414, "Amortization Unprovided for Elsewhere."

104. Construction Work in Progress.—This account should include the amounts expended upon plant that is in process of construction under estimates or work orders, but is not ready for service at the date of the balance sheet. It includes interest charged to construction, also such proportion of plant supervision expenses, engineering expenses, tool expenses, supply expenses, and general expenses as may be properly chargeable to the construction work included under this account.

When the work is completed on any job the cost of which has been included in this account, this account should be credited with the amount at which it stands charged, and the appropriate fixed capital or other accounts should be concurrently charged, but expenditures should not be carried in this account beyond the close of the fiscal year next succeeding that in which the expenditures were made.

105. Investment Securities.—This account should include the cost or book value of stocks, bonds, and other evidences of indebtedness (including notes having dates of maturity of more than one year from date of issue), held by the accounting company, and pledged as collateral for other securities issued or assumed, or held as a means of obtaining or exercising control over other corporations, for devotion to future operations, or for securing other business advantages.

In stating this account or the subaccounts provided hereunder on the balance-sheet statement the par value of securities issued or assumed by the accounting company and carried in this account should be deducted in order that this account will show only the cost or book value of securities of other companies. (See sec. 5.)

The following subaccounts should be kept by class A companies:

106. *Stocks of System Corporations.*[3]
107. *Funded Debt of System Corporations.*[3]
108. *Miscellaneous Stocks.*
109. *Miscellaneous Funded Debt.*

Note A.—Short-term notes payable upon demand or having dates of maturity of one year or less from the date of issue should not be included herein but in account No. 110, "Advances to System Corporations for Construction, Equipment, and Betterments," or No. 117, "Bills Receivable," as may be appropriate.

Note B.—In the annual reports of class A and class B telephone companies to the commission investments will be required to be classified so as to show those held subject to a lien of some character and those held free of all lien or pledge.

110. Advances to System Corporations for Construction, Equipment, and Betterments.—This account should include advances to controlling, affiliated, controlled, and subsidiary

[1]The total of accounts Nos. 100 and 101 should be drawn down on the balance-sheet statement, and the total of accounts Nos. 102 and 103 deducted therefrom, the difference being shown as the net total.

[2]The total of accounts Nos. 100 and 101 should be drawn down on the balance-sheet statement, and the total of accounts Nos. 102 and 103 deducted therefrom, the difference being shown as the net total.

[3]By a *system corporation* is meant any controlling, affiliated, controlled, or subsidiary corporation.

corporations to enable such corporations to pay for construction, equipment, or additions and betterments, if such advances are of a permanent nature (i.e., if there is not an understanding that the advances are to be repaid within one year), or if it is understood and intended that reimbursement shall be made by the issue of the securities of the debtor corporation.

NOTE A.—Gifts to system corporations made without expectation of reimbursement should be included in account No. 353, "Miscellaneous Appropriations from Income," or No. 416, "Miscellaneous Appropriations of Surplus," and not in this account.

NOTE B.—Temporary advances on open accounts to system corporations and such advances for purposes other than construction, equipment, and betterments should be included in account No. 119, "Accounts Receivable from System Corporations."

111. MISCELLANEOUS INVESTMENTS.—This account should include investments of a permanent nature in property (tangible or intangible) other than that held for the operation of the company's plant as a telephone system. It should include such items as investments in lighting, water, and power plants, manufacturing plants, lands, and buildings and other property not a part of the company's plant for telephone operations or of facilities incident thereto.

112. CASH AND DEPOSITS.—This account includes the various items respecting cash and special deposits as provided in the following subaccounts:

113. *Cash.*—This account should include the amount of current funds available for use on demand in the hands of financial officers and agents, or deposited in banks or with trust companies, and cash in transit for which agents receive current credit.

114. *Special Deposits.*—This account should include deposits to pay declared dividends and matured interest; cash realized from the sale of securities and deposits with trustees for disbursement when the purposes for which the securities are sold are accomplished; amounts realized from the sale of property and deposited with trustees other than in sinking funds until the property is replaced; special deposits (in other than sinking funds), for the payment of debts and interest not matured; money and securities deposited to secure the performance of contracts; and other deposits of a special nature not provided for elsewhere.

In stating this account on the balance-sheet statement the amount of any securities issued or assumed by the accounting company and included herein should be deducted in order that this account will show only the assets herein other than the company's own securities. (See sec. 5.)

115. EMPLOYES' WORKING FUNDS.—This account should include amounts advanced to general and special agents, and other officers and employes as working funds from which certain expenditures are to be made and accounted for.

116. MARKETABLE SECURITIES.—This account should include the cost or book value of securities held in the company's treasury unpledged and free for sale and not necessary or desirable for the telephone company to hold for the purpose of maintaining the integrity of its telephone system.

In stating this account on the balance-sheet statement the par value of securities issued or assumed by the company and carried in this account should be deducted in order that this account may show only the cost or book value of securities of other companies. (See sec. 5.)

117. BILLS RECEIVABLE.—This account should include the cost of all collectible obligations in the form of bills receivable or other similar evidences of money receivable on demand or within a time not exceeding one year (excluding interest coupons).

NOTE A.—Notes having dates of maturity of more than one year after date of issue should not be included in this account but in account No. 105, "Investment Securities," on No. 116, "Marketable Securities."

NOTE B.—When loans to system corporations[8] for construction purposes are evidenced by demand or short-term notes intended later to be exchanged for other securities, the amount of such loans should be included in account No. 110, "Advances to System Corporations for Construction, Equipment, and Betterments."

118. DUE FROM SUBSCRIBERS AND AGENTS.—This account should include amounts due from subscribers for services rendered or billed and from agents and collectors authorized to make collections from subscribers.

This account should be kept in such manner as will enable the companies to make the following anaylsis, viz.:

(*a*) Amounts due from subscribers who are still receiving telephone service.

(*b*) Amounts due from subscribers whose telephone service has been discontinued and whose accounts are in process of collection in the usual way.

(*c*) Amounts due from subscribers whose telephone service has been discontinued and whose accounts are in litigation or otherwise suspended.

Credit to a subaccount hereunder such amounts as may be concurrently charged to account No. 304, "Uncollectible Operating Revenues," to provide a reserve for uncollectible accounts due from subscribers and agents. If such reserve is provided, when any bill for services has proved impracticable of collection, this subaccount should be charged and the account in which the bill is carried should be credited.

119. ACCOUNTS RECEIVABLE FROM SYSTEM CORPORATIONS.—This account should include amounts due from controlling, affiliating, controlled, or subsidiary corporations on open accounts other than those provided for in account No. 110, "Advances to System Corporations for Construction, Equipment, and Betterments."

120. MISCELLANEOUS ACCOUNTS RECEIVABLE.—This account should include all amounts owed to the company upon accounts with solvent concerns (other than system corporations and subscribers and agents), also the cost of all accounts and claims (except notes or negotiable bills), upon which responsibility is acknowledged by solvent concerns or which are sufficiently secured to be considered good, and of all judgments against solvent concerns where the judgment is not appealable or suspended through appeal.

NOTE.—Cash on deposit in banks or with trust companies should not be included in this account but in account No. 113, "Cash," or No. 114, "Special Deposits."

121. MATURED INTEREST AND DIVIDENDS RECEIVABLE.—This account should include all interest accrued and due but not yet collected upon bonds, notes, or other commercial paper held by or for the benefit of the company, and all dividends declared and due by solvent concerns but not yet collected, the right to which is in the company.

(*To be continued.*)

Illinois Toll Clearing House to Meet.

H. B. Gilmore, secretary of the Independent Toll Clearing Co., has called a meeting of the stockholders of that organization at the Jefferson Hotel, in Peoria, at 2 p. m. Tuesday, January 14. This is the first day of the convention of the Illinois Independent Telephone Association, which is also to be held in the Jefferson.

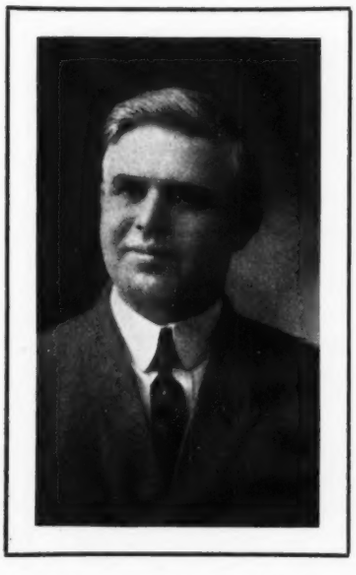
It is proposed at this meeting of the Clearing company to elect a vice-president and three directors, all to fill unexpired terms. The stockholders will consider a change in originating commissions from "Sent Paid" and "Received Collect" to "Sent Paid" and "Sent Collect." The question of lowering the cost of clearing the tolls will also come before the meeting.

A Quartet of Men Prominent in the Telephone Field

HALL L. BROOKS, of the Hall L. Brooks Co., Tomahawk, Wis., was born in Medford, Mass., October 1, 1864. He received a common school education and early engaged in the lumber business. From 1882 to 1886 he was associated with James N. Clarke & Co. at Savannah, Ga

From 1886 to 1896 he was a member of the firm of the Brooks & Ross Lumber Co. This was followed by the Brooks & Mackelburg Sash & Door Co., of Milwaukee, Wis., with which Mr. Brooks was connected during 1896 to 1898, and which specialized in the products usual to a corporation of this character. Since that time he has been in the cedar pole business at Tomahawk, Wis. The telephone business has long been interested in cedar poles, and the Brooks concern has become very well known over the entire country as shipper of a fine grade of white cedar. Mr. Brooks himself is a conspicuous figure in the telephone world—widely known and highly esteemed. He has been a regular attendant at the national conventions, although not active in their deliberations. He is a Mason.

FRANK J. GOODMAN, salesman for the Century Telephone Construction Co., Buffalo, N. Y., has been associated with that organization since 1905. His present territory is Western New York state and Western Pennsylvania. Mr. Goodman was born in Gowanda, N. Y., September 3, 1876. He was educated in the public schools of that city and Austin, Pa., and is a graduate of the Buffalo Business University. Before entering the telephone field Mr. Goodman was for five years bookkeeper and salesman in stationery and printing lines in Buffalo. In June, 1901, he entered the factory of the Eureka Electric Co., in Chicago; a year later he went as troubleman and inspector with the Granville Telephone Co., Granville, N. Y. There he remained until November, 1904, when he resigned and was out of the telephone business for a year. In November, 1905, he became connected with the Century company and has remained with that organization since. He has covered western and central New York and was in Ontario selling Century goods for five years.



HAROLD D. STROUD, manager of the traffic department of the Illinois Telephone & Telegraph Co., Chicago, has been engaged in electrical and telephone work since 1893. He has worked with the Thompson-Houston Electric Co., the Standard Telephone Co., the Northwestern Telephone Exchange Co., the Western Telephone Construction Co., the Chicago Telephone Co., the Sterling Electric Co., the Controller Co. and the Western Electric Co., prior to his engagement with the Illinois Tunnel Co., reorganized in May, 1912, as the Illinois Telephone. Mr. Stroud was born in New York City January 25, 1876. His school education ended at the age of seventeen, when he entered the employ of the Thompson-Houston Co., at St. Paul, Minn., as apprentice. Later, while working, he finished a two-year course of law at the University of Minnesota. He also studied telephone and electrical engineering, taking a correspondence course. Mr. Stroud is a close student of telephone economics, has given much consideration to rate questions and patented a number of telephone appliances.

H. WORTHINGTON BIRNEY, secretary and general manager of the Plum Run Valley Telephone Co., Bowerston, Ohio, was born near that city October 11, 1867. He was educated at Scio College, Scio, Ohio, and the Ohio State University at Columbus. Mr. Birney has always farmed and is an exponent of modern ideas in farming, as he is in telephone operation. He specializes in blooded stock of several kinds, including Belgian horses, Berkshire hogs and Plymouth Rock chickens. He organized the Plum Run Valley Telephone Co. in 1905 and has been secretary and general manager since that time. He installed the system, which runs out of Uhrichsville, Ohio, and devotes as much time as is necessary to its operation. Although it is comparatively a small company, it has thus far been very successful and is giving service to a number of farmers over a considerable stretch of country. In short, the Plum Run Valley Telephone Co. is one of the hundreds of rural lines which have sprung up in response to a general demand, and which have met that demand in a thoroughly comprehensive manner.

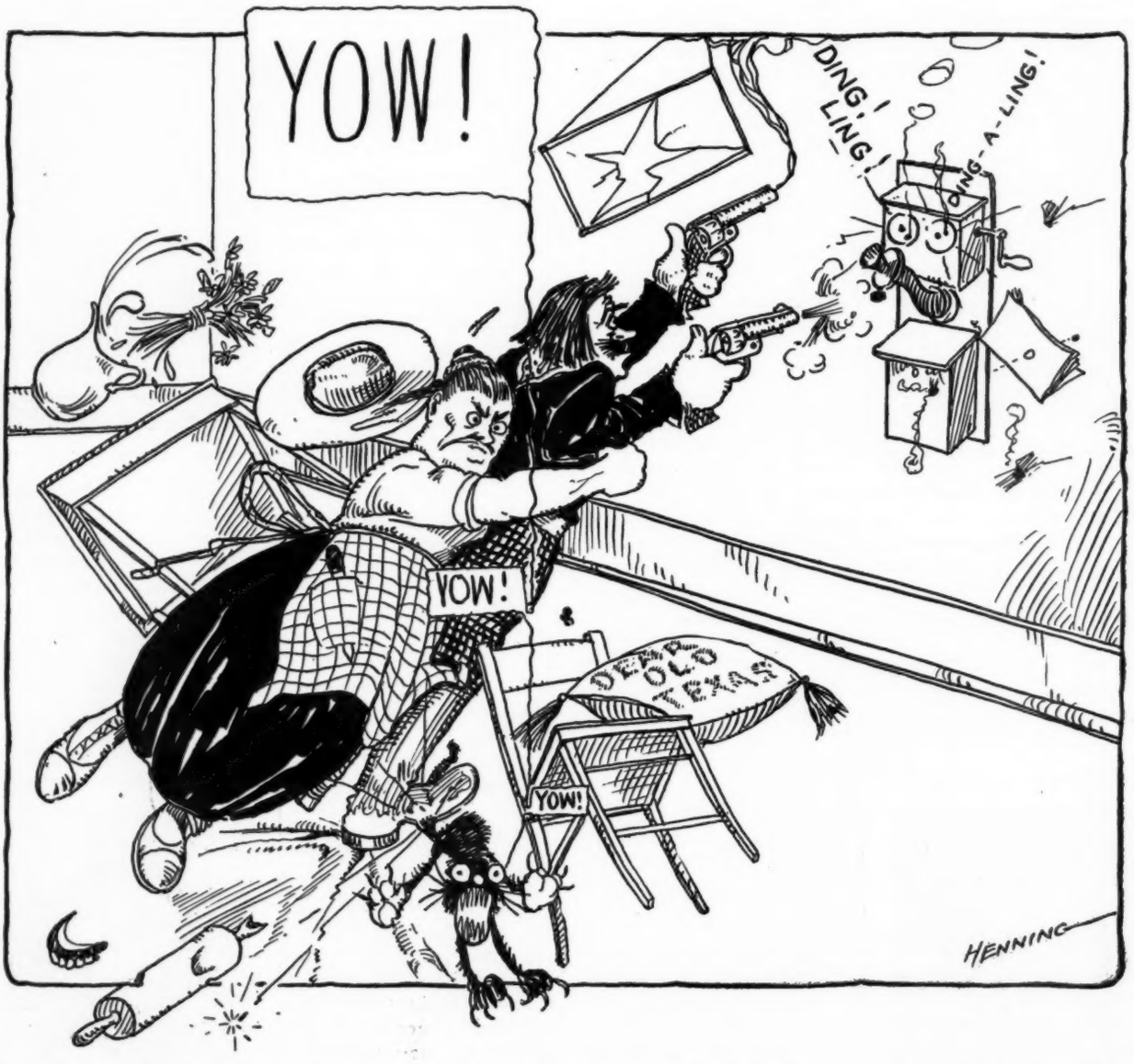
In the Rural Line Districts

Ed. Kurtz, Jr., local manager of the telephone system, told us, Friday night, that he was handling ten men besides himself all the time now and would need that many up to about Christmas. The company is doing an immense amount of repair work in the way of resetting poles.—Oakland (Ill.) Messenger.

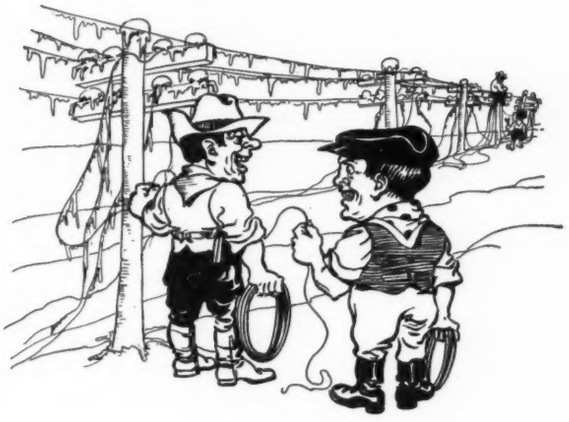
The telephone company has out new directories which can be had by calling at the central office.—Ellsworth (Kansas) Report.

Manning is to have a telephone exchange.—Fargo (N. Dak.) Forum.

John Miner has been rehabilitating old "87" phone line with new poles. It formerly connected with the Western Illinois; it will join the Macomb company.—Macomb (Ill.) Journal.



The Old Cattleman advises us that there was a slight disturbance at the O. K. Restaurant the other evening. He says: "A misguided visitor from Red Dog ambled over to our town to get a taste of real metropolitan life, and, after inspecting the New York store, the Bird Cage Op'ry House and the Red Light saloon (where he lingered too long), filed his appearance at the O. K. eating house. Mrs. Rucker, who reigns in that wickiup absolutely supreme—not to say dominant, pro and con—objected to the Red Dog etiquette displayed, and refused to serve any grub to said guest, whose deportment was in no wise regular. The Red Dog outlaw had the poor taste to draw his arsenal for purposes of intimidation. Therein he showed how deep his ignorance of unterrified nerve and backbone of Mrs. Rucker. "Believe me," she said afterward, in describing the incident, "I haven't been wrastling grub for these Wolfville sports for ten years without knowing how to handle a coyote from Red Dog." Whereupon she came down upon her uninvited guest with all the force of ten ton of brick. Just then the telephone bell rang, and this illiterate Red Dog gent, never having seen or heard of a telephone before, is plumb carried away with the notion that the tinkle foreshadowed some dire disaster to himself, so he cuts loose with both Colts and, being reasonably close, naturally ruins that wall set complete. That telephone had been a heap of comfort to Mrs. Rucker and this assault on her gossip-supply made her angelic temper take wings for good. She sure did give the representative of Red Dog a thorough licking, not to say defeat. Some furniture was broke, but Wolfville's reputation for peace and order was maintained.—Wolfville (Ariz.) Warwhoop.



There Was a Bad Sleet Storm in the City of York, Pennsylvania

a couple of years ago and, before the sun shone again, a lot of linemen were working overtime—

But a few lines kept right on the job.

Can you guess why? Just because they were Copper Clad Steel.

The City Council went out and took a look at the Fire Alarm System, then went in where it was warm, and passed a resolution instructing the Superintendent of the Fire Alarm System to use nothing but Copper Clad Steel Wire thereafter.

That Fire Alarm System used No. 12 Copper Clad Steel. You can use No. 14 to connect your subscribers and,—*when it sleets, smile.*

Trade Mark
"Weld Clad"

Duplex Metals Company

Chester, Pennsylvania

Chicago Office
853 Peoples Gas Bldg.

New York Office
30 Church Stree

Business Essays
Connected in Multiple-Series
Number Four

Rural lines who sell dry batteries for gas engine ignition as well as phone work should buy a utility cell. Or rather *the* utility cell—there is only one.

Thus they can buy in quantities; get the quantity price on the ones they use themselves and make a worth while profit on those they sell.

The **Red Seal** is the only dry battery guaranteed for *any* work *any* dry cell can perform.

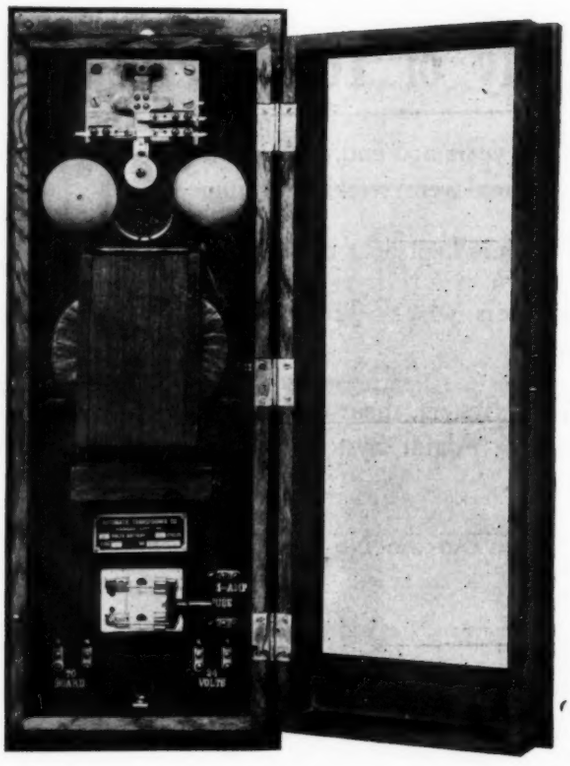
Guarantee

We will *credit* account, *replace* batteries or *refund* amount paid for batteries including transportation charges if they do not prove satisfactory.

Manhattan Electrical Supply Co.

New York Chicago St. Louis

"No More Bell Troubles and Livery Bills"



"Rings Them When They Can't Ring Each Other"

Storage Battery Set

The Automatic Transformer Co.,
Kansas City, Mo.

Dear Sir:

We received the Ringing Machine some days ago and it is more than coming up to our expectations.

Yesterday we had a line six miles long with ten telephones and the next to the last telephone on the line had a dead ground at the lightning arrester and we were able to ring all the other telephones, although the parties on the line could not ring each other.

Yours truly,
THE WELLSVILLE CO-OPERATIVE TELEPHONE ASSN.,
(Signed) James E. Mallory, Mgr.

(Wellsville, Kas.)

Like results can be had in your exchange. Write today for catalog and copy of "They themselves have said it," containing scores of letters like the above. This advertisement will not appear again until accumulated orders have been caught up.

The Automatic Transformer Co., 407 Broadway, Kansas City, Mo.

Patent Pending

"Hy-Po-Stat"

The All Metal and Porcelain Cable Protection
This is the terminal that

"Protects Your Cables"

and makes your investment a permanent one.
For further information ask your jobber, or writ

The Royal Electric Company
SIDNEY, OHIO

Telephone and Switchboard Repairing

You can have your **plugs, jacks, keys, drops,** etc., **repaired** and made like new, at a **saving in cost** to you over new apparatus.

With our up-to-date tools and machinery, including all of the equipment of the old Sterling Electric Company, we are qualified to do all kinds of **telephone** and **switchboard repair work** and to furnish the **highest grade** of **repair parts** and **apparatus** at reasonable prices.

We solicit your inquiries for repair parts, special apparatus, etc.

Lafayette Electric & Mfg. Co.

Lafayette, Indiana U. S. A.

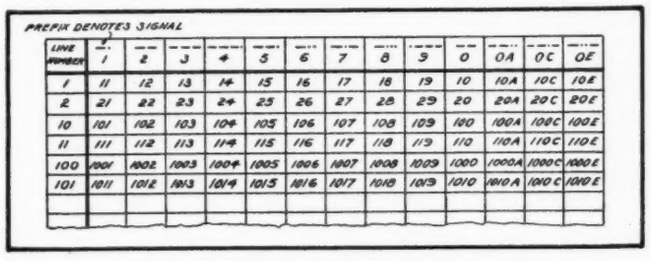
Please tell the Advertiser you saw his Announcement in TELEPHONY.

Practical Subjects—Letters and Discussions

Signal Chart for Non-Selective Ringing.

The accompanying chart covers a very satisfactory method of selecting signals for magneto party lines where non-selective instruments are used. The chart being made, of course, to suit the individual needs of the switchboard.

To show how to interpret a ring, suppose the number 16 is called for. By running along the upper line it is



PREFIX DENOTES SIGNAL

LINE NUMBER	1	2	3	4	5	6	7	8	9	0	0A	0C	0E
1	11	12	13	14	15	16	17	18	19	10	10A	10C	10E
2	21	22	23	24	25	26	27	28	29	20	20A	20C	20E
10	101	102	103	104	105	106	107	108	109	100	100A	100C	100E
11	111	112	113	114	115	116	117	118	119	110	110A	110C	110E
100	1001	1002	1003	1004	1005	1006	1007	1008	1009	1000	1000A	1000C	1000E
101	1011	1012	1013	1014	1015	1016	1017	1018	1019	1010	1010A	1010C	1010E

Chart of Signals for Party Line Ringing.

found that 6 calls for a long and two short rings. As there is only one figure left in the number given, it must indicate the line on which to ring, which would be No. 1 line.

Supposing 1010*a* is the number called for. In glancing at the signal prefix in the upper line *oa* is found to mean two long and two short rings. Running down the column until we come to the number called for and then along the line as far as possible to the left we find the line number to be 101.

A single line telephone may be always followed by the letter *S*, which will make possible the use of any number for party line work. In connection with the use of this prefix, a spot of red paint on each individual line will help a new operator in learning the code and the location of lines on the switchboard.

With the above chart it is only necessary for the operator to learn the prefixes and the accompanying rings thoroughly by practicing with a ringing key connected to a high resistance buzzer.

The system should be flexible enough for the average exchange, although I believe it could be worked up to any number of lines and stations without confusion.

I have used the plan for two years and have only found it defective in two points, namely: parties calling for 108 are sometimes given the number 100*a* or others calling 103 are given 10*c*. This of course could be eliminated by omitting the number whenever possible.

Etna Green, Ind. F. L. Whitaker.

Letters from a Retired Lineman to His Nephew.

Podunk Valley Farm.

Dear Ben:

The sooner you get over "flying off the handle" at every little thing, the better it will be for you. You write that the engineers have decided to put in a 90-foot steel tower on our side of the river and carry a 900-foot span to the bluff on the other side; the fixture on the bluff to be about 15 feet high. You are offended that they decided to bring the general foreman from Ohio to boss the job.

I hope you haven't been foolish enough to let them know you're "sore" about it. Even if they do furnish you with plans in detail, you are not experienced enough to tackle such a job and do it economically. You probably haven't two men in your gang who can go up on a 90 foot iron fixture and keep one hand free to work with. Perhaps if the general foreman is favorably impressed with you, he may use you on the job. I hope he does, for then you'll learn what sort of a job it is and be glad you didn't tackle it.

It will be an opportunity to learn something about heavy construction work. You will probably have finished done pretty well to have been placed in charge of a gang in so short a time, but don't get the idea that you are underrated because you are not made a general foreman. Make yourself conspicuous in the way of good reliable work and an average amount of it. Then when they want someone for a particular job, they are quite as liable to pick you out as any one. It may be all right to "blow your own horn," but somehow it has a better effect if some one else concludes to blow it for you.

Once in a while you meet a man who has an idea which he thinks is better than has yet been put into practice, but he keeps it to himself for fear he won't get credit for it. Consequently his mind is clogged with it. It's in his way, so to speak. If you have anything to suggest in the way of improvements, study it out well and send it to headquarters. Whether it is adopted or not, your mind is relieved and you can think of something else.

Usually the men who have the consideration of your reports, are men who have "won their spurs" already. They are willing enough to boost by saying "Young So-and-so suggests such-and-such a thing, which meets with my approval."

You say you are using dynamite in some places on account of frost and rock. Every state has laws governing the use of explosives and you'd better get a copy of them and post yourself and your men thoroughly. A license is necessary in some states, issued to an individual who must have full charge of the work, the same as a pilot on a vessel coming into port. The last year I was out, I carried a license through two states. In the third state I couldn't get one for lack of experience in handling explosives.

It you have an accident, the company will stand by you if you have complied with the law, but if you haven't, it will get you in pretty bad. There are some things one is supposed to know without being told and this may be one of them, though you'll probably find it somewhere in your instructions.

While I'm on the subject, there are generally certain laws governing the use and care of the highways. Sometimes a little knowledge of them is useful. I remember one instance when Jim Barber was building a line in southern Illinois. There were several bad trees which he wanted to cut; dangerous ones, old and half dead. Some of them were on the highway and some just inside the fence on private property. The land owners not only claimed the right to the trees on private property but also those along the roadside which did not interfere with travel.

Jim was bound to have those trees and he spent a day in town looking into the matter. He came back and made each farmer an offer of two dollars per tree and the gang do the cutting. This was refused. That afternoon he brought three highway commissioners down and showed them the trees. He also told them the law. The law required the property owner to remove any tree, building, or obstacle that was considered dangerous to public travel by the commissioners.

Jim convinced the commissioners that the trees were dangerous and might block the highway at any time. The commissioners ordered them cut forthwith. Jim compromised, but did the cutting.

The chief inspector came out the other day to look me over and see just how I was fixed to take care of trouble in

case of an emergency. He told me an amusing instance about one of his men. He went out to see him and drive over his section of line. It seems the lineman kept a team for the use of which the company paid him two-fifty a day for such times as he used it on the work.

When the inspector reached there the lineman had but one horse available, so he went to the liveryman and bought one for $50, paying $10 down.

He hitched the horse in with the one he had and drove over a 100 miles or so of line, being out all told 12 days. When he retunred home, he took the horse back to the liveryman saying it was not what he wanted. The livery man took the horse back and kept the $10 as well. The lineman figured a profit of $20 on the trip at that. He said if he had hired the horse, it would have cost him one-fifty a day. There are tricks in most trades but that was a new one to me.

Have gone over the mutual telephone business pretty thoroughly with Doc. Stuver and we're about decided which we want.

In the first place, we want a franchise from the county commissioners to use the highway. This will give us a foundation or legal standing. Then we want to incorporate and issue stock to those who desire to connect with the line. Each subscriber must take one share of $100 and pay for it within a year. Each can subscribe for five shares, but no more.

A rental charge of five dollars a year will be made for maintenance.

We propose to purchase equipment, build the line and install the instruments, paying for every bit of labor required to do the job.

When the job is complete a reserve fund of $200 will be retained and any balance returned to the stock holders.

This will give us something tangible in case a larger company reaches into our part of the county, and we may be able to realize something in a merger deal or outright sale. The way they propose building, there would be no title right or equity to transfer and nothing in the way of a plant which another company would want.

Potatoes had jumped ten cents before I took up the last of my options. I paid a five-cent bonus on one thirty-bushel lot, as they were exceptionally fine, clean, and already sacked. The fire has died down, so will close.

Your Uncle Dick.

An Aunt's Letters to a Switchboard Girl.

The New Year.

My Dear June:

When this reaches you, the "Christmas Waits" will have become a thing of the past, whatever they may have held for you and your patrons. No doubt you smiled with the happy bride, as she waited before the altar; rejoiced silently with the father and mother of some mite of humanity, that came at this holy time to abide in their home; sorrowed with another who stood beside the sick bed and waited for the passing of a loved one to another life; but now, as we stand at the end of a year—the momentous event—the death of a span of human existence—as some philosopher calls it—we give greeting to '13 and wonder what, with its cabalistic figures, it may have in store.

What memories of the old year are we taking over with us? In your youth there can be no enmities to forgive, nor heartaches to be healed, I trust. The question, June, for you girls, is: "Was the time profitably spent; did you make the most of opportunity and have you buried no regrets beneath the shroud?"

Putting the old from us—hark to the bells! Greeting again, New Year! With your bow of promise ever rosy red to youth, as it should be! May it bring to you, June, and all of our girls, triumphant success to all effort!

Hark to the bells! Still the greetings linger in our minds! May love and duty stand upon the threshold of this year for you, with peace and plenty abiding.

As we turn to greet this last-born of Father Time, and bid him enter, through purple mist, with our mind's eye we see visions. One central figure is the success we long have sought. In this new day, which is the best the world has ever seen, new opportunity waits on good plans, intelligently executed with unabated industry.

This holiday spirit will displace the practical in the lives and thoughts of the most sedate, so let me pass on to all of you girls this greeting I received.

"I am thinking of you today, because it is New Year's, and I wish you happiness. And tomorrow, because it will be the day after New Year's, I shall still wish you happiness; and so on, clear through the year. I may not be able to tell you about it every day, because I may be far away, or because both of us may be very busy, or perhaps because I cannot even afford to pay the postage on so many letters, or find the time to write them. But that makes no difference. The thought and the wish will be here just the same.

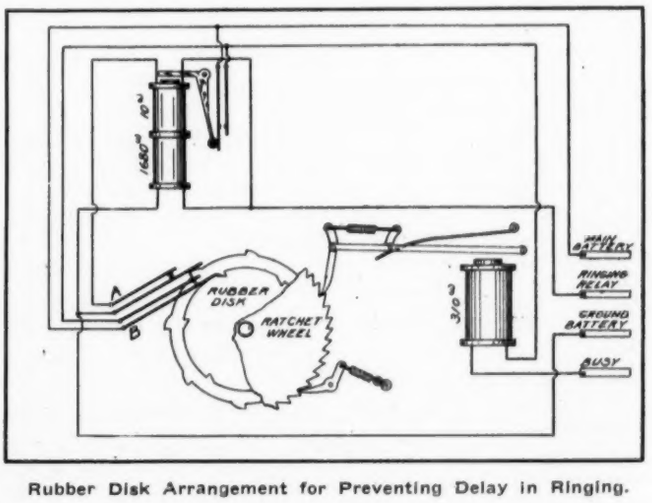
"In my work, and in the business of life, I mean to try not to be unfair to you or injure you in any way. In my pleasure, if we can be together, I would like to share the fun with you. Whatever success or joy comes to you will make me glad. Without pretence, and in plain words, good will to you is what I mean, in the spirit of New Year's."

Isn't that a beautiful spirit to take with us through the coming year? That brings me to a remembrance of your question of "How can I improve my general culture, or add to my knowledge of this work, while the routine is so wearing?" Soon, I will tell you what I think of that.

As ever, Your Aunt.

Preventing Delay in Ringing of Automatic Telephones.

In automatic telephone exchanges using the type of ringing interrupter shown in the sketch, it happens that frequently the traffic is not heavy enough to keep the interrupter working



Rubber Disk Arrangement for Preventing Delay in Ringing.

all the time. It often occurs that at such times, the interrupter will stop just after the ringing period. This will cause a delay on the next call equal to the length of time it takes the interrupter to turn to the next ringing period.

This can be overcome by fastening a fiber or rubber disc to the interrupter wheel with as many notches in as ringing periods on interrupter. Then adjust springs *B* so they will be in one of the notches when the interrupter springs *A* are starting to close. We used a broken receiver cap for the disc.

Great Falls, Mont. Charles F. Ross.

How Personal Solicitation Increased Toll Revenues

Manager, Devoting Few Hour a Week to Personal Investigation of Reasons Why His Toll Business Was Not Larger, Finds Ready Welcome, Straightening Out Snarls, Encouraging Use of His Lines and Materially Adds to Earning of Lines

By E. T. Teece

If it is profitable for a mercantile or any other business establishment to personally solicit business, why won't the same rule hold good in the telephone business? It certainly is just as feasible for a telephone company to gain business by the personal solicitation method as any other line of trade.

In the mad scramble for local business prestige, the value of increased toll business is in many instances lost sight of. Especially is this true where there are competing companies, and each company is trying to get the larger number of subscribers.

The toll business of a company of any size or of any large connections is one of vital importance, and too much emphasis cannot be put on the fact that to let slip opportunities for toll revenue is a serious mistake. It is true that increased local business is what increases the local prestige, but do not forget that some things are also due the connecting company which depends on the toll business to pay for the investment it has made in the toll lines.

Personal Work Beats Advertising.

I believe in advertising and I believe it is a help in gaining toll business, but I do not believe it is half the help that personal solicitation is. Big firms are usually the large toll users, and the executive heads of big firms in this busy age are fortunate if they can find time to read the news of the day, let alone the advertising columns. However, this same man, who is too busy to read your advertisement, will be glad to see you at his office. He will readily go into the situation with you; he will tell you why he is not using your line to this town and to that town; he will tell you just what he wants, just what he can use, and just what he will do for you.

I appreciate the fact that none but large companies can afford to hire a toll solicitor, whose sole business it is to build up the toll traffic, but there are very few managers who cannot find time to devote 10 or 12 hours a month to the proposition of increasing the toll revenue of the company, at the same time increasing the efficiency of the toll service.

Let me tell you the actual experience of one manager who decided the one way to build up his toll revenues was by personally going among his toll users and finding out if there was any business he could handle if he got it, and why he was not getting it.

He picked out a number of his steady toll users to commence on, went to see them and found out many things relative to his own lines and service that he would perhaps otherwise have remained in ignorance of. He found that, at certain times of the day, one of his toll circuits was so busy that the firm calling could not afford to wait. He found that transmission was bad to other places. He found that, in many instances, the toll user was using other lines to a town that it supposed this manager did not reach. He found that the systems in other towns were at fault and he found where there was a great possibility for increasing his business if he could overcome conditions which he knew, only in a vague way, existed. In other words, he found just exactly why he was not getting the business, and he also found that in nearly every instance he could get business if he improved his service.

He also brought to the attention of the subscribers the fact that he wanted their business—all of it, if he could get it—he told them of his appreciation of the business they were already giving him and assured them that outside conditions would be remedied at once.

Digging Into the Details.

He accumulated enough data relative to conditions and service to be of vast assistance in helping build up the toll business. Then he went to work and straightened out the kinks in his toll service, and in his own territory; he fixed up his lines, saw that the toll user's telephone was in order; and he got in touch with connecting managers and got them busy fixing up their portion of the lines and service that was affected.

He started this on every line and to every point that was in question. But he did not wait until all things he found out were remedied, for, as fast as he found a condition was overcome, he went back to his subscriber, told him that the service was now just what he wanted and urged him to call to that town and asked him to report any inattention or poor service at once, which would immediately have personal attention.

In nearly every instance the toll user would try this manager's line and, by strict supervision over the toll service, the latter was able to keep the business and receive added business from this same man to other points.

This personal solicitation accomplished this much, it conveyed the impression to the subscriber that the manager was personally interested in giving him just what he wanted. He showed the subscriber that it was his intention to give him value received and he impressed the fact that his company was willing to investigate and remedy any complaint, no matter how trivial, that he or any other toll user or subscriber, might make. It did something else. It brought him in close business touch with his subscribers; it furthered his acquaintance in the business world; and it not only advertised his toll service, but it helped his local business, inasmuch as the toll user was also a subscriber and would be a booster.

This manager increased his gross toll business over $4,000 in one year and he is still at it. True, he has a good and a large field to work in, but it remained for him to get business that for five or six years the company had not had, just because the toll service had not received the attention that it should.

A few hours a month spent on the toll business, with an earnest desire to increase the revenue, will, if the work is done personally, be the most profitable hours a manager can spend. Even if he has a good, hard-working toll solicitor the manager himself can be of powerful influence in building up the toll traffic if he will devote just a little of his time each month to seeing his people in person. It makes no difference how large the firm is or how big the individual, human nature is pretty much the same, and the attention one pays these people is bound to be noticed and reciprocated.

The success of personal solicitation depends also largely on the personality of the solicitor. He should have some knowledge of each toll user's business and the characteristics surrounding it, be it ever so superficial.

Effective Advertising of Store Telephone Facilities

J. N. Adam Co., Operating One of Buffalo's Largest Department Stores, Places Its P. B. X., Together with Various Departments of Telephone Order Taking Clerks, in Its Show Windows— Instructive Working Exhibit Attracts Large Crowds

By John D. Holland

The use of the telephone in department stores is becoming greater and greater. All business houses of this character have a large number of departments carrying diversified stocks and, to keep these stocks up-to-date, it is necessary that they be merchandised promptly. The cause of many of the "bargain sales" is this necessity of turning over the stock quickly.

During brisk and active selling, the clerks are taxed to their utmost and can at best wait upon only a very limited number of customers. This is realized by the business managers, who are more and more endeavoring to educate the public to use the telephone to place their orders during these special sales, as well as in the course of regular daily purchasing.

The J. N. Adam Co., operating one of the largest department stores in Buffalo, N. Y., is a thorough believer in having adequate telephone service for its own and its customers' convenience, and of advertising its telephone facilities. In this store the Federal Telephone & Telegraph Co., of that city, has a two-position common battery exchange switchboard, with 75 stations, connecting every department. The trunking facilities are 18 local trunk lines, besides the trunks connected directly to the long distance board of the Federal company.

Special lines and "order-taking" operators are assigned to suburban sections; that is, calls from the Ripley, North East, Dunkirk, Fredonia, Brocton, Silver Creek section come in on certain lines to a special "order-taking" clerk; the section of Springville, Arcade, Chaffee, East Aurora and Attica, Hamburg, etc.; the section of Batavia, Byron, Akron and adjacent points; and the section of Lockport, Niagara Falls, Tonawanda and Lewiston and neighboring points are handled in the same way. The operators thus become acquainted with the customers in the outlying districts of Buffalo within a radius of 75 miles and over, and handle their orders with promptness and accuracy. There are also several "order-takers" required for the city service.

As the orders are received, they are distributed to the various departments to be filled, thus allowing the clerks to spend all of their time in filling the orders. By this method a clerk can put up by far a greater number of orders than if they were given direct to him by the customer in person.

The J. N. Adam Co., in order to educate the public to use telephone service, is showing in detail the excellent equipment it has. During one week recently the Federal private branch exchange switchboard was placed in one of the large show windows on the Main street side of the store. The board was operated in the regular way. In each window, for five consecutive windows, were stationed the "order-taking" operators, who were recording the orders that come in from the various towns, and from the city.

This novel publicity of its telephone facilities given by the J. N. Adam Co., created a great deal of attention. All day long, and during the evening, the crowd was dense in front of the windows.

This display emphasizes the fact that in every town there must be many business concerns which should have private branch exchanges. Exchange managers might profitably call their attention to the matter and discuss the subject with these possible customers to show them the value of a private branch exchange.

There are also concerns which have private branch exchanges, but which do not avail themselves of its full advantage. The exchange manager might discuss this situation with them and explain where they can reap a decided advantage by urging their customers to telephone orders.

There has been a feeling in the past that orders over the telephone were a nuisance, but, on deep consideration, everyone will find that telephone facilities, even to an extravagant extent, properly advised, will stimulate trade. In other words, exchange managers should urge their subscribers to have more than an ordinary amount of service, and show them that the advertisement of that fact will bring a good return on the cost of these extra telephone facilities.

An Effective Window Display of Private Branch Service at Buffalo, N. Y.

From Factory and Salesroom

Conventions: National Independent Telephone Assn., Chicago, February 18, 19, 20; Independent Telephone Men, Pittsburgh, Pa., January 16; Illinois Assn., Peoria, January 14, 15, 16; Minnesota Assn., St. Paul, January 28

To Handle Southwest Business from Chicago.

The Stromberg-Carlson Telephone Mfg. Co. of Rochester, N. Y., has transferred its Kansas City sales office to Chicago. There it has much larger quarters, a more complete line of telephones and telephone apparatus, also a more complete and efficient sales and engineering organization.

"This change," said the company in advising its customers, "will enable us to give our Southwest customers better service than was furnished through the Kansas City branch. We will continue to carry at Kansas City a selected stock of standard telephones, boxed and ready for immediate shipment to our customers in the Kansas City territory.

"On and after January 1, 1913, kindly address all communications to the company at No. 708-10 West Jackson Boulevard, Chicago, Ill., instead of Kansas City. Although shipments will be made from Kansas City, please remember to send your instructions to Chicago where all orders will be handled the same day as received.

"Our traveling representatives in the Kansas City territory will call on you regularly as before and offer you every assistance which our unexcelled service provides."

The Chase Truck Line for 1913.

The Chase Motor Truck Co., Syracuse, N. Y., is mailing to the trade a card suggesting that the Chase line is a good one to tie to for the year. One side of the card is embellished by the portrait of a charming young woman, which is here shown.

All in Favor of Chase Trucks, Say "Aye!"

The complete line of Chase trucks includes six models, from 500 to 4,000 pounds capacity, and equipped with all kinds of bodies. Up to two tons capacity, the Chase line is said to represent the most complete and varied assortment of motor trucks ever shown—something for every delivery need.

"The Chase line," says the maker, "is the banner one, first because Chase trucks are giving efficient daily service. This is being demonstrated everywhere. Second, the absolute simplicity of Chase mechanism appeals to the user, for he sees in this simplicity many dollars saved in the cost of handling and upkeep. Lastly, the extremely low prices interest the user."

The Chase line will be shown at the Motor Truck Show, to be held in Chicago the week prior to the National Independent Telephone Association's annual convention. It will be of interest to every telephone man who can make arrangements to attend this big show.

Cement Show to Be Held Next Week.

On January 16 there will open, in the Coliseum building, Chicago, the annual exhibition of the cement industry. This is expected to be the biggest and best cement show ever held. It will continue one week. The features of it which might be of particular interest to telephone men would naturally be those which indicate developments in the manufacture of reinforced concrete poles, as well as possible new methods for the employment of cement in underground and exchange construction.

Singer Engaged by Telephone.

A New York theatrical producing firm, Werba & Luescher, has repeated Oscar Hammerstein's plan of a year or two ago by engaging a singer for one of its principal roles after a voice test over the telephone, says a contemporary.

One of the partners, while rehearsing a production, had occasion to try out a new singer. It was imperative that the other partner should hear the applicant sing before she could be engaged, and it was important that a singer be engaged for the vacant part as soon as possible. The two got in telephone communication, and by pressing into service a megaphone, used by the theater doorman in calling carriages, to supplement the regular telephone transmitter, the test was accomplished without difficulty and the singer's engagement approved—which we venture to add, won for the telephone its well-merited appreciation—of both the producers and overjoyed singer.

A Small Parts Bulletin.

In every exchange, time and again, information on small telephone parts is wanted, and is lacking. The Kellogg Switchboard & Supply Co. of Chicago, in its bulletin No. 65, recently from the press, has listed, with new cuts, binding posts and connectors. To quote from the first paragraph of the bulletin:

"Suitable binding posts, connectors or punchings are always in demand by operating telephone companies, and also telephone and annunciator assemblers. This bulletin shows and describes a few of the products of the company's screw machine and punch press departments. The gage and material of the connectors listed in this bulletin are those

used regularly in turning out the company's own product. The manufacturing equipment is declared to be complete and of the latest improved design, producing each type of post or conductor with wonderful accuracy."

In addition, this bulletin shows two views of the magnificent equipment used by this company in the production of its unsurpassed line.

Adaptability of Motor Trucks.

Many types of bodies will be seen on the new models of motor trucks and delivery wagons to be exhibited at the Chicago Automobile Show during the week just preceding the National Independent telephone convention. One maker alone who manufactures only a 3,000-pound capacity

Line Gang Ready to Start on Pole Replacing Job.

vehicle will show 11 different styles of bodies on his machines just to indicate the great diversity of application. Other manufacturers will also make the most diversified exhibits possible, and salesmen in attendance at the different stands will be provided with albums of photographs showing scores of other applications and body styles.

There will be some unusually interesting and spectacular exhibits among the 250 models to be shown by 68 manufacturers. Aside from merely building special bodies to mount on standard chassis, the truck maker often goes to great lengths to give a customer a work vehicle especially suited to his needs.

A new type of gasoline truck with front wheel drive that will be exhibited at the show for the first time has no machinery whatever back of the driver's seat, which makes it possible to attach a pair of rear wheels and very low dray type body commonly used around docks, especially in California. Trucks used by telephone and electric light and power companies and by safe and machinery concerns have powerful winches that can be driven by the vehicle motor to haul cable through conduits, stretch overhead cables, set up tall poles, hoist safes to upper stories of office buildings, load and unload heavy machinery, and so on.

Thus, the motor truck is not merely a substitute for horse-drawn vehicles but is an independent self-moving power plant that can be adapted to many special purposes that cannot be accomplished by any other single means.

Book Review.

AN EXTENSION OF THE DEWEY DECIMAL SYSTEM OF CLASSIFICATION APPLIED TO THE ENGINEERING INDUSTRIES; by L. P. Breckenridge and G. A. Goodenough, originally issued as Bulletin No. 9 of the Engineering Experiment Station, University of Illinois, in 1906.

The filing and classification of engineering data has become a matter of much importance, and this bulletin was prepared for use as a guide in carrying out such work. The original edition of Bulletin No. 9 was subject to the usual gratuitous distribution, and the subsequent demands were such that a second edition was printed and ultimately distributed. Altogether 20,000 copies were sent out. The demand having continued, it was finally decided again to revise and to print a limited edition. This has now been accomplished and the revised bulletin, much extended as compared with the original edition, is ready for distribution. It presents subdivisions of subjects in such detail as to constitute a complete classification for most engineering industries, even though they are highly specialized. The revision has been made in accordance with the 1911 edition of "Decimal Classification" by Melvil Dewey.

The revised edition of Bulletin No. 9 will not be subject to gratuitous distribution. A copy will be sent post-paid upon the receipt of 50 cents. Requests should be sent to W. F. M. Goss, director of the Engineering Experiment Station, University of Illinois, Urbana, Illinois.

Efficient Circular Matter.

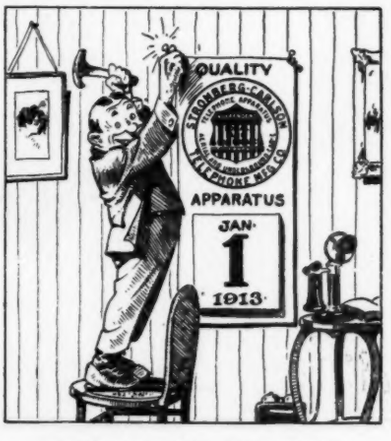
The Kellogg line of pole changers and apparatus is declared to be admittedly unequalled, not only for its reliability and practicability but for its value with every type of equipment. Equally efficient is said to be the line of circulars and instruction folders that go out with this apparatus. For instance, take the instructions for installing No. 9-A pole changer.

In a great deal of electrical apparatus the buyer's information is limited to a set of blueprints and blurred letter copies. The No. 9-A instruction folder is printed on high-grade paper, in large, clear type, with two excellent half tone illustrations of open and closed views of the apparatus, the open view listing all the various parts, while the type matter describes in a comprehensive way how the pole changer should be mounted and operated.

If you are interested in this subject, write the Kellogg Switchboard & Supply Co., Chicago, stating the type of your equipment and its needs and the appropriate bulletin and folders will be sent promptly, with full description.

The Time for Resolutions.

Phoney Bill says: "January first is the time for making resolutions. Here's a good one—use Quality Apparatus exclusively." This amiable gentleman is shown on the January calendar blotter of the Stromberg-Carlson Telephone Mfg. Co.,



Starting the New Year Right.

of Rochester, N. Y., nailing up his 1913 calendar with the aid of a hammer and some ten-penny nails. That should put it in place for keeps. He is evidently expecting the current year to be one well worth keeping track of.

Legal Cases and Decisions

By A. H. McMillan

Appointing a City Electrician.

"Where there are two electrical companies occupying the streets and alleys of a town, would it be legal or proper for the town to appoint the superintendent of either of the plants as city or town electrician? Our ordinance gives the town electrician jurisdiction over the telephone company as well as the municipal electric light plant.

"Has the town electrician the right to force the joint use of poles? Can we compel the electric light company to place their service wires over and above our telephone wires where the light plant occupies the far side of the alley?"

Although you did not state the facts fully, we do not think it would be either legal nor proper for the town to appoint the superintendent of one of the electrical companies as town electrician, where he, as town electrician, has jurisdiction over the private company of which panies.

We cannot answer the question as to whether the town electrician has the right to force the joint use of poles, because we do not know what authority the ordinance creating the office confers upon him. The towns of Iowa have police control and authority over their streets, and if it were necessary for the safety of the public to have poles jointly used, there would undoubtedly be authority in some municipal body or officer to compel the joint use. What municipal body or officer that would be, we cannot tell without knowing the laws and ordinances of your town.

It is doubtful to us whether the joint use of poles would ever be a requirement necessary, or conducive to the safety of the public. The separation of poles and wires is considered proper construction and more prudent than joint use, although it depends on the current and voltage the wires carry. For instance, the stringing of the wires of two telephone companies upon the same poles would not be dangerous and might be a proper pole regulation, while the stringing of electric light wires and telephone wires on the same pole would be dangerous in itself.

You also ask whether you can compel the electric light company to place their service wires over and above your telephone wires where the electric light plant occupies the far side of the alley. It is considered a violation of safe telephone construction to place telephone wires over the high potential wires of electric light and power companies.

We do not understand exactly the situation you have in mind and hence cannot tell whether you are entitled to require the electric light company to change the present position of their wires or not. You will find the respective rights of telephone companies and electric light companies discussed in Chapter 11 of McMillan on Telephone Law.

Seasonableness of Ordinance.

The city of Texarkana, Ark., passed an ordinance May 6, 1912, giving the Mackay Telegraph & Cable Co. the right to use the streets and alleys of the city but imposing certain conditions that were not acceptable to the company. The conditions required that the wires of the company be placed underground in a certain portion of the city. The company was willing to put its wires underground for a part of the distance but claimed that a requirement for a farther distance than thus conceded, was unreasonable.

It sought in court a temporary injunction to restrain the city from interfering with its construction in streets and alleys. In its bill it alleged that it was an Arkansas corporation, engaged in the transmission of messages between points in Arkansas, and between points in Arkansas and points in the several states of the Union. It was further alleged that the company had accepted, in writing, the post roads act of congress, and was operating in accordance with the provisions of that act. Under this situation, the federal court held that the company was legally entitled to use the streets and alleys of the city for the construction of its line, subject only to the city's right to impose reasonable conditions or requirements in the exercise of its police power.

The last section of the ordinance provided that it should be in force from and after its passage and the filing by the company of a written acceptance thereof in the office of the city clerk. This the company did not do. In fact, it notified the council that it would not accept the ordinance. Hence, the court held that the company was not bound by its terms and that the ordinance could not be in force unless it was reasonable.

The court would not pass on the reasonableness of the ordinance, because at the time the case was heard, the time for the city to answer had not expired. Mackay Telegraph & Cable Co. vs. City of Texarkana, 199 Federal, 347.

Furnishing Public Service.

A public service corporation, which has accepted a franchise from the city authorizing it to operate therein, is bound by the implication of the law to make no unreasonable discrimination between those to whom service is, or is to be, furnished. That is, it must not be partial and must serve alike all who are similarly circumstanced with reference to its system, or who are members of any class which it has undertaken, or is otherwise bound to serve. So held the Supreme Court of Minnesota in a suit against the Consumers' Power Co. to compel it to give service to a resident of the city of St. Paul.

The evidence was held to show that the resident's house was situated within a zone of service already established by the company, and was therefore **prima facie** entitled to the same service furnished to other houses within the same zone. A provision in the company's franchise that the city should not require the company to make "extensions" except upon certain conditions, was held not to affect the right of the resident to invoke the aid of the courts. State ex rel. Mason vs. Consumers' Power Co., 137 Northwestern, 1104.

Connection Between Companies by Order of Council.

The city council of Childress, Texas, made an order commanding two telephone companies in the city to physically connect their telephone lines for the purpose of transferring telephone wires from one line to the other. The companies refused to make the connection and suit was brought by the state for a penalty of $10 a dav on account of failure.

The court held that, part of the order being authorized by act of legislature, such part was valid and therefore the right to recover the penalty prescribed existed, even though the part of the order attempting to fix compensation on messages originating outside the city was void. It was further held that it was not necessary, in order to enable the state to recover, that a message should have been offered for transmission and refused.

It was further held to be no defense to the action that the company had made unsuccessful efforts with the other company to arrange for a proper distribution of the compensation for handling messages, it being its duty to make the connection and leave the matter of distribution of compensation for future settlement. Judgment against the telephone company was sustained. Southwestern Telegraph & Telephone Co. vs. State, 150 Southwestern, 604.

Liability of Municipality for Falling Pole.

A parent brought suit for the loss occasioned by the death of his child, who was killed by the falling of a pole in a public street. The pole was erected some 15 or 20 years before the accident and was used to sustain an electric light pole on the opposite side of the street with which it was connected by a steel cable. It broke off near the surface of the ground where it was much decayed. The decay was from the inside and there was but little if any indication of the decay on the surface of the pole.

The question submitted to the jury was whether the municipality had caused the pole to be inspected with reasonable care. The Supreme Court of Pennsylvania reversed a judgment against the borough on the ground that its duty in the care of its streets was not to seek for defects but to observe them when they became observable in the exercises of reasonable supervision, the rule in relation to inspection by the borough being less stringent then it would have been had the pole been unlawfully on the street, or erected by the borough, or under its sole management. Kost vs. Ashland Borough, 84 Atlantic, 691.

Condensed News Reports

Officers of Companies are Earnestly Requested to Forward Us Promptly All Financial and Other Statements as Soon as Issued, and Any Items of Interest as to Their Plants and Systems

Personal.

A. L. PETERSON, of Cresco, Iowa, was married on Christmas day to Miss Klara Thorsten, of Lansing, Iowa. Mr. Peterson

A. L. Peterson.

is well known as a manufacturer of telephone condensers and other specialties.

H. A. BALL has accepted the position of manager of the Rossville Telephone Co., at Rossville, Ill.

CLYDE SHANNON has resigned his position as manager of the Citizens Mutual Telephone Co., at Jefferson, Iowa.

L. W. SHIPMAN has resigned his position as manager of the Gowanda, N. Y., exchange of the Federal Telephone & Telegraph Co.

H. E. LAMPMAN has been promoted to the management of the Charlotte, Mich., exchange of the Michigan State Telephone Co.

BRUCE ASPLEY has accepted the position of manager of the Farmers Mutual Telephone Co., at Franklin, Ky., succeeding Frank Goosetree, resigned.

GEO. R. DIXON has been promoted to the position of local manager of the Williamsport, Pa., exchange of the Bell Telephone Co. of Pennsylvania.

E. H. CROWLEY, of Three Rivers, Mich., has been appointed local manager of the Inter-State Independent Telephone & Telegraph Co., at Sterling, Ill.

S. W. MCGART has been transferred from the management of the exchange of the Union Telephone Co. at Sharon, Pa., to the management of that at New Castle, Pa.

C. H. WALKER, of Salisbury, has been appointed superintendent for the Chesapeake & Potomac Telephone Co. in Kent county, Md., to succeed J. H. Nichols, resigned.

H. H. FREEMAN has resigned his position as traffic manager of the Central Union Telephone Co., in Toledo, to enter into other business. He is succeeded by Fred R. Eckley, of that city.

RAY ALDRICH, of Saginaw, Mich., has accepted the position of manager of the Michigan State Telephone Co., at Ithaca. Rex Hamilton, former manager, has been transferred to Saginaw.

S. J. KENNEDY, who has been general manager of the Ogle County Telephone Co., for the past 15 years, has resigned his position to take charge of J. P. Griffin's business in the vicinity of Rochelle, Ill. L. A. Mutton, of Oregon, Hl., will be his successor.

THOMAS T. RAMSDELL has been elected a director of the New York Telephone Co. Mr. Ramsdell was vice-president and general manager of the Bell Telephone Co., at Buffalo, until that company was bought by the New York Telephone Co. and continued his connection with the Bell company thereafter, in an important advisory capacity.

VIRGIL HAYDEN, engineer in the operating department of the Federal Telephone & Telegraph Co., of Buffalo, N. Y., has been promoted to the position of chief engineer of the Century Telephone Construction Co. He will be retained as a member of the general engineering committee of the Federal company and his appointment will bring the Century company into even closer relations with the Federal company than heretofore, which will be extremely beneficial to both organizations.

Obituary.

FRANK PIERCER ROSS, former manager of the old Columbus Telephone Co., now the Central Union Telephone Co., and for many years assistant manager of the Western Union Telegraph Co., in Columbus, Ohio, died recently of heart trouble, at the age of 59 years. Mr. Ross was one of the group of six who founded the Columbus Telephone Co., and was retained by the Bell company in the capacity of manager after the merger.

New Companies.

WARSAW, N. Y.—The Warsaw Rural Telephone Co. has been organized with a capital stock of $3,000. The directors are: Floyd B. Stearns, F. W. Hatfield, T. T. Baird, C. O. Gollett, William E. Hennan, A. W. Mangun, all of Warsaw and H. F. Flint, of Clifton Springs.

SANFORD, S. C.—The S. J. Telephone Co. has been chartered with $5,000 capital stock. The incorporators are: J. M. Ralston, C. M. Brownlee, of Washington; and J. L. Cockins, of Canonsburg.

Construction.

CHIPPEWA FALLS, WIS.—The Chippewa Falls Telephone Co. is planning to install an automatic telephone system here.

MONA, WYO.—The Mona Short Line Telephone Co. is planning to extend its system about 20 miles.

SWATOW, CHINA.—A new telephone system to be known as the Chaochow-Huichow Telephone Line will be built here.

Miscellaneous.

ALHAMBRA, CAL.—The State Railway Commission has granted to the Pacific Telephone & Telegraph Co. the right to purchase the San Gabriel Valley Home Telephone Co.

SAN FRANCISCO, CAL.—The Pacific States Telephone & Telegraph Co. has bought out the Home Long Distance Telephone Co.

INDIANOLA, FLA.—The Brevard County Telephone Co. has purchased the New Smyrna Telephone Co., at New Smyrna, Fla.

HUBBLE, KY.—The Hubble Telephone Co. is constructing a line to Lancaster.

SHARPSBURG, KY.—The Sharpsburg Home Telephone Co. and the Bath Home Telephone Co. have consolidated and will hereafter be known as the Bath Home Telephone Co.

FALL RIVER, MASS.—The Fall River Automatic Telephone Co. has been sold to the New England Telephone Co.

GREAT FALLS, MONT.—The Great Falls Automatic Telephone Co. has been sold to the Mountain States Telephone & Telegraph Co.

TRENTON, N. J.—The United States Independent Telephone Co. has been dissolved and its charter forfeited.

FRIENDSHIP, N. Y.—The Friendship Telephone Co. has voted to move its offices to New York.

COLUMBUS, OHIO.—The Oil Belt Telephone Co. has been granted permission by the public service commission to purchase the plants of the Central Union Telephone Co., at Bloomdale, Cygnet and Jersey City.

DEFIANCE, OHIO.—The Northwestern Telephone Co. has bought the property of the Central Union Telephone Co. at Defiance.

SAN ANTONIA, TEXAS.—The Hackberry Telephone Co. has filed notice of dissolution.

SMITHFIELD, VA.—The Home Telephone Co. was almost completely destroyed by fire recently.